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FIRST AERO WEEKLY IN THE WORLD

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The AIRCRAFT ENGINEER AND AIRSHIPS

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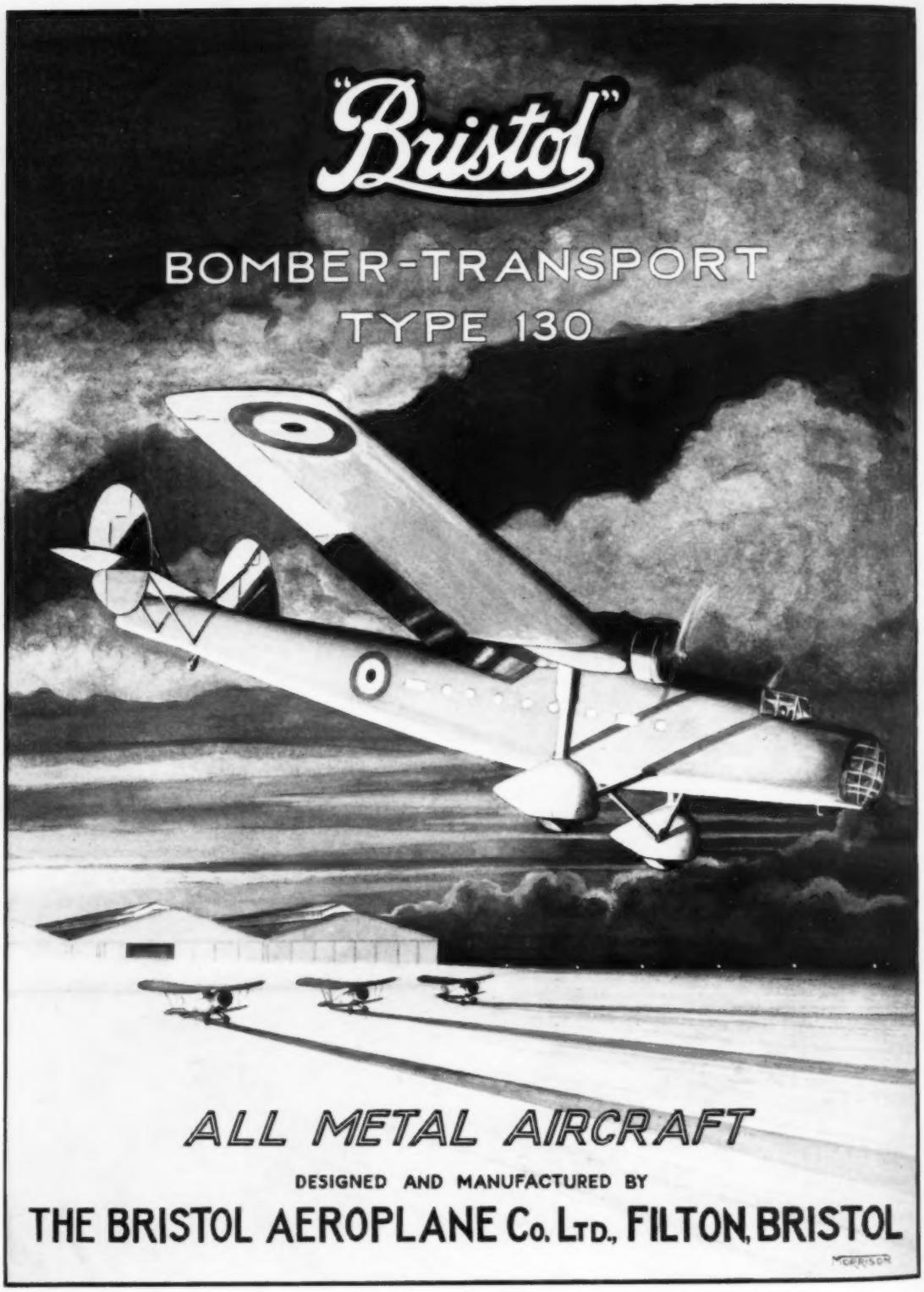
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FLIGHT

The AIRCRAFT ENGINEER AND AIRSHIPS

FIRST AERONAUTICAL WEEKLY IN THE WORLD : FOUNDED 1909

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A Volunteer Reserve

EXPERIENCE in the late war showed that once the country is mobilised it takes less time to produce an aeroplane than it does to train a pilot. Moreover, haste in flying training justifies the old proverb by reducing speed. In 1914-18 there was tremendous waste and delay through accidents due to hurried and faulty training. Lord Swinton has decided that, so far as mere ability to fly goes, the R.A.F. shall have a substantial reserve of pilots behind it.

Hitherto there has been one R.A.F Reserve recruited from two sources: (1) short-service officers who have finished their time in the squadrons, and (2) civilians who either could or could not fly before they joined. Most of them had to be taught to fly after being accepted. To train these pilots and to keep them up to a certain minimum standard by means of a yearly course there were the four civilian schools at Hamble, Hatfield, Filton and Brough. Many of the Reserve pilots lived far away from any of these schools, and, in fact, the small number of schools put a check on the numbers of the Reserve.

The new R.A.F. Volunteer Reserve, a title obviously copied from the Royal Naval Volunteer Reserve, aims at setting up more schools and, at the same time, separating civilian entrants from short-service officers. For the first object there can be nothing but praise. A flying school at practically every large town seems to be the object, and this should give to British flying an impetus such as it has never received before. The demands on the time of each pupil will be reduced to workable proportions, and provided that employers are sufficiently patriotic to help the movement there should be no difficulty in reaching the figure of eight hundred pilots a year.

As for the separation of the short-service officers from the civilian entrants, the way had been prepared for that when it was decided not long ago that civilian entrants should become sergeant pilots. *Flight* has always held that there never was any reason why even the majority of R.A.F. pilots should be officers. In other Services a commission is for the men who lead; the actual fighting is done by "other ranks." The R.A.F. V.R. will still offer better prospects than other Services in that the qualified pilot will always be a non-commissioned officer. At least that may be presumed.

Squadron training for civilians is still only provided by the Auxiliary Air Force, and on mobilisation the R.A.F.V.R. will not be fit to be hurled straight into the fighting line. They will first have to receive some combined training. But very valuable time will be saved by having a reserve of men who are at least able to fly.

The Atlantic Scheme

IT has been generally believed that experiments on a trans-Atlantic air service would be left to Imperial Airways, working in conjunction with Pan American Airways. Sir Philip Sassoon's statement last week shows that a joint company will be formed, Canada and the Irish Free State each nominating a company to combine with Imperial Airways in the work The main outlines of the scheme are given on page 165.

There is nothing novel in this idea, for Imperial Airways has already joined with other parties to form Indian Transcontinental Airways and Qantas Empire Airways. The British Empire being what it is, there are obvious advantages in working in this way. Newfoundland will participate to the extent of finding a subsidy which will be agreed upon later. It will also provide ground facilities, and will benefit by being the first port of call for west-bound mails when the weather does not dictate a diversion to the Azores-Bermuda route. If it should prove, as is quite possible, that the southern

route is preferable for regular operation, Newfoundland and Canada, possibly also the Irish Free State, would seem to fade out of the picture.

The position of the Irish Free State in the scheme is not clear. Sir Philip's remark that "in consideration of their contribution the Irish Free State Government will be entitled to participate in the Empire Air Mail Scheme, if and when they so desire, without payment of further subsidy but only of the postal payment" is puzzling. The Empire Air Mail Scheme is not just the Atlantic scheme, and what the I.F.S. is to be allowed to do is left as a mystery. The I.F.S. is also to get £6,000 per annum from the United Kingdom for meteorological services rendered, though, of course, Canada and Newfoundland will provide their own meteorological, radio and airport services without any help from the United Kingdom.

Multum in Parvo

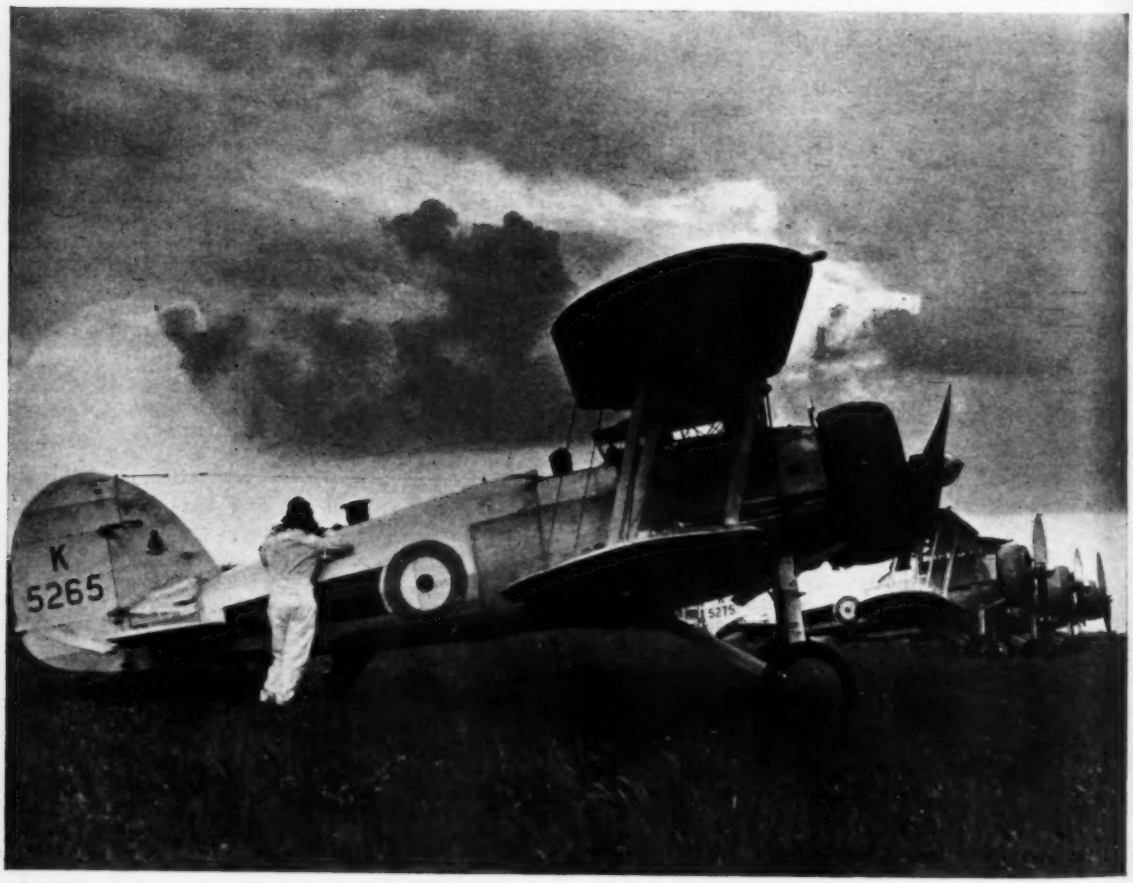
TRAINING of pilots is likely to be the "bottleneck" of the R.A.F. expansion. Design and manufacture can be organised, rationalised and "shadowised," but the human factor plays a very important part and is not amenable to the same kind of mass-production treatment.

It would seem obvious that the kind of aeroplane used, or, rather, to be used, by the R.A.F. must have an important effect on the type used for training. Which type is used for *ab initio* flying training probably does not matter a great deal, but there should be intermediate types to enable the new pilot to make the step from the school type to the military type without too great changes in characteristics.

An examination of the new types being built in large numbers for the R.A.F. discloses the fact that a very large proportion are of the low-wing monoplane type. All are provided with the latest aids to efficiency, such as retractable undercarriages, trailing edge flaps, variable pitch airscrews, and, in most cases, supercharged engines.

Logically, an intermediate training type should be introduced, in which all these modern adjuncts are incorporated in the design so that the young pilot may have an opportunity to familiarise himself with their operation. Obviously, it is not advisable to take any unnecessary risks with the actual military types. Such risks could probably be greatly reduced by introducing a small training type of aircraft of some 200 h.p. It should not be very difficult so to design such a machine that it reproduced fairly completely the characteristics of the more powerful service type.

With the exception of the supercharged engine of low power, the type envisaged could be produced at once. It is suggested that the supercharging of small engines should be taken in hand and developed without delay.



ALERT: A fine study of Gauntlets of No. 111 (Fighter) Squadron at Biggin Hill being prepared to intercept a raid during last week's Air Exercises. (*Flight* photograph.)

The Outlook

A Running Commentary on Air Topics

To Johannesburg at 200 m.p.h.

BY deciding to postpone the date of the start of the London-Johannesburg race, the Royal Aero Club has had in mind the fact that by the end of September there will be a full moon; pilots are by no means unanimous in regarding this as an advantage, although the majority will probably welcome it. Another advantage gained by the postponement is that the entries list may become slightly larger, and machines may be finished which would not otherwise have been in time for the race.

Most interest naturally attaches to the speed race, and by the end of this month, when the entries at double fee close, there should be a fair number of entries for the event. So far it looks as if the Percival Mew Gull with Gipsy Six engine is likely to be the fastest machine in the race. This little monoplane is capable of something like 225 m.p.h., and Capt. Percival has been able to install sufficient tankage to give it a range of considerably more than 1,000 miles. This will mean that the longest stage to be flown non-stop, from the control at Belgrade (now chosen instead of Vienna) to Cairo, is well within its reach. With pilots such as Majors Miller and Halse, who know the African route intimately, the Mew Gull may be expected to give a good account of itself.

Other machines in what may be termed the 200 m.p.h. class are the Airspeed Envoys and the B.A. Double Eagle. A "dark horse" in the race is likely to be the Miles Peregrine, now just about to make its first test flights. The Blackburn H.S.T.10 is also nearing completion, and if the estimated performance figures are borne out, this machine might be well worth entering in the race.

Unreal but Useful

THE Air Exercises held last week must have been an unmitigated nuisance to the Fighter and Bomber Commands. They are in process of reorganising themselves into the new Group system, and changes of Air Officers Commanding are also taking place. Air Marshal Joubert de la Ferté commanded the defence, while Air Marshal Sir Hugh Dowding, gazetted as A.O.C. Fighter Command, took the opportunity to visit some fighter aerodromes during the Exercises. Some Squadrons are still out of the country, while the business of expansion occupies nearly all minds. Despite all this, the need for practising the various elements of the offence, and particularly the non-regular elements of the defence (i.e., searchlights and Observers) is so important that it was wisely decided to hold some sort of exercises at all costs.

The dice were loaded against both sides. The bombers had their style cramped by being given three objectives by day and only two (both aerodromes in Essex) by night, as well as by the time factor. They could not wait for the most favourable bombing weather. Fighters are always badly handicapped by day when no anti-aircraft guns are in action against the raiders—and, of course, shells never are, or can be, allowed to explode among them in sham fighting. The known absence of balloon aprons also adds to the difficulties of the defence. Consequently, though it is gratifying to note that the proportion of interceptions was high, no useful conclusions can be drawn from the actual fortunes of individual raids.

None the less, the practice was invaluable. It was interesting to note how the vital question of communications for the defence is being speeded up. Low-flying day raids were an interesting innovation, and obviously the defence should have as much practice as possible in dealing with this new form of attack. The searchlights were very active, and on the whole did well, but it would be shirking facts to expect part-time Territorials to be as masterly in finding raiders as is possible for full-time regulars. In war the Territorials would become full-time men, and would soon be as good as the best. In peace time there is only one advice to give to them and to those set over them, and that is, "Practise, practise, practise."

Pou Redivivus

TWO events have occurred recently which should encourage *Pou-du-Ciel* enthusiasts. Last Saturday's meeting at Ramsgate showed that this type of aeroplane can provide quite good sport, even when the weather is far from perfect. In France the full-scale tests being made in the Chalais-Meudon wind tunnel have recently disclosed the fact that the very serious vice of the "standard" *Pou*, an uncontrollable dive, can be cured very simply by increasing the range of angles through which the front wing can be used.

Saturday's race gave quite a variety of *Poux* an opportunity to fly in a strong, gusty wind, and there was no sign of any of them having a tendency to get out of control, even when racing at full speed, the condition when trouble is most likely to arise. M. Mignet's new machine, the H.M.18, with a 38 h.p. engine, was convincingly demonstrated by the famous Frenchman, and seems to have an amazing performance, particularly in the matter of climb.

It is interesting, and probably significant, that in the H.M.18 the front and rear wings do not overlap, and the vertical gap between them is much greater than in the original *Pou*.

At Chalais-Meudon it has been found that if the front wing is provided with controls to bring its maximum angle of incidence to 14 degrees instead of the 9 degrees which was the original limit, the machine can be brought out of a dive, no matter how steep, and can even be righted from the inverted position, in which previously it was stable. It would seem that we are well on the way towards turning the *Pou* into a proper flying machine.

Putting the Cart . . .

THE decision of Portsmouth to turn down the plans for converting Langstone Harbour into an Empire air route base unless the Air Ministry agrees to provide the bulk of the funds needed can scarcely cause surprise. After all, it will be very many years before the benefits which Portsmouth may ultimately derive from being the Empire terminus can be expected to reduce the increase in rates which the dredging of channels, or the even more costly scheme of dams at the entrance, will inevitably mean to the good people of Portsmouth.

While towns and cities are very properly expected to provide their own air ports for internal services, it does not by any means follow that the same principle is the best when applied to Empire air routes. The establishment of an Empire air port is a necessity, whether the town near which it is situated benefits or not. Consequently, there is something to be said for making such an air port a national rather than a local undertaking.

The really disquieting thing about the Portsmouth scheme is that if it comes to nothing, as well it may, there is quite a good chance of a number of Empire flying boats being ready for inaugurating the new Empire air services, and no suitable place from which they can start. Southampton Water could be used, at a pinch, but is too crowded.

Scratch and sub-scratch: Lord Patrick Crichton-Stuart (Hendy Hobo) awaits the fall of the flag in the final of the Folkestone Aero Trophy race, while Captain Percival prepares to start his Mew Gull, which had another ten minutes to wait. (*Flight* photograph.)

THE FOLKESTONE TROPHY

First of the Cinque Ports "Annuals" Won by Mr. R. Grubb (Aeronca) in Poor Weather

THE babies appear to be having it all their own way in this season's handicap races. This time it is the Folkestone Aero Trophy which has been won by an ultra-light, though if this particular machine, an Aeronca, had not been a little faster than any which have been raced before, there might have been a very different story. If Mr. K. K. Brown's Tiger Moth, too, had been as fast in the final as it was in its heat, this machine would have beaten the Aeronca by seven seconds, so one can hardly blame the handicappers.

In fact, the whole field, flying over a sixty-mile course, came home within a period of two and a half minutes, and it would appear that Messrs. Dancy and Rowarth had allowed for a light wind which was virtually non-existent during the final. Additionally, there was a low cloud-base, patches of heavy rain and a consistent haze over the whole course to handicap the pilots of the faster machines. At one period the organisers were doubtful whether it would even be possible to run the final on the appointed day.

Non-Starters

Out of an entry of twenty-three, only sixteen faced the starter in the heats, and one of these was not able to go away owing to last-minute insurance difficulties. Among the non-starters were two Puss Moths (one to be flown by Mr. Lipton) which had to be scratched as a result of the recent 120 m.p.h. limit order for these machines. Each of the remaining fifteen, therefore, had a much better chance of reaching the final, for which ten applicants were being selected. The course was exactly the same as that used for last year's event. From Lympne, competitors flew on as straight a line as possible to the Capel hangar, beyond Folkestone, dived over the cliff, turned around the Folkestone harbour light, flew along the coast to Hythe and turned at the gasworks to climb the steep hill up to Lympne, where a cross marked the turning point. And the hill was very steep for the little fellows!

In the first heat, Mr. Field-Richards led off the field with a four-minute start on Mr. Grubb's Aeronca. The scratch man was F/O A. E. Clouston, this time flying a Miles Sparrow Hawk. Unfortunately, his revolutions dropped steadily on the last two legs of his first lap, and he eventually came in with a blown plug. After this lap the order was otherwise unchanged save for the fact that Mr. K. K. Brown (Tiger Moth) had just managed to overtake Mr. C. H. Tutt's Gipsy Moth—to the delight of the commentator, Mr. W. E. Davis, whose entry it was. Lap two saw the gap between these two widen and the other gaps closing up. At the finish Mr. Brown had taken the lead from both the Cub and the Aeronca—whose pilot had been wasting twenty seconds a lap by turning around the hangars and, metaphorically speaking, running his wheels on the roadway behind, to the horror of the Air Ministry. Lord Crichton-Stuart (Hendy

Heat I.

Pilot.	Machine.	Handicap Allowance.	Flying Time.	Speed.
		min. sec.	min. sec.	m.p.h.
1. K. K. Brown ...	Tiger Moth...	15 42	32 27	109.0
2. P. Field-Richards	Taylor Cub...	28 53	45 55	77.0
3. R. Grubb ...	Aeronca ...	24 57	42 38	83.0
4. C. H. Tutt ...	D.H. Moth...	16 30	34 26	102.75
5. Lord Crichton-Stuart.	Hendy Hobo.	9 57	28 14	125.5
6. C. S. Hancock	Cessna ...	6 58	25 24	139.5
7. Mrs. Calthrop	D.H. Moth ...	15 05	33 47	104.75

Heat II.

1. L. T. H. Cliff ...	B.A. Swallow.	19 11	36 38	96.75
2. J. A. M. Du Port.	D.H. Moth Major.	14 47	32 18	109.5
3. A. J. S. Morris	D.H. Moth ...	17 00	35 22	100.25
4. E. W. Percival	Mew Gull ...	Scr.	18 40	190.0
5. R. F. Hall ...	Hillson Praga	21 12	40 39	87.25
6. Mrs. Macdonald	Hawk Major .	7 03	26 57	131.5

Final.

Pilot.	Machine.	Handicap Allowance.	Flying Time.	Speed.
		min. sec.	min. sec.	m.p.h.
1. R. Grubb ...	Aeronca ...	24 57	41 49	84.75
2. K. K. Brown	D.H. Tiger Moth.	15 42	32 47	108.0
3. P. Field-Richards.	Taylor Cub ...	28 53	46 06	76.75
4. L. T. H. Cliff	B.A. Swallow...	19 11	36 29	97.0
5. J. A. M. Du Port.	D.H. Moth Major.	14 47	32 15	109.75
6. C. H. Tutt ...	D.H. Moth ...	16 30	34 12	103.5
7. E. W. Percival	Mew Gull ...	Scr.	18 06	195.5
8. A. J. S. Morris	D.H. Moth ...	17 00	35 13	100.5
9. Lord Crichton-Stuart.	Hendy Hobo ...	9 57	28 10½	125.25
10. R. F. Hall ...	Hillson Praga...	21 12	40 36	87.25

Prizes.

Folkestone Aero Trophy (presented by the late W. Bentley, Esq.), and £50 (presented by the Mayor and citizens of Folkestone) went to Mr. R. Grubb.

Silver Medal and £25 (presented by Lord Wakefield) went to Mr. K. K. Brown.

Silver medal and £10 (presented by the Vice-presidents of the Cinque Ports Club) went to Mr. P. Field-Richards.

Folkestone Aero Speed Trophy (presented by Mrs. W. E. Davis) and £10 (presented by the Vice-presidents of the Cinque Ports Club) went to Capt E. W. Percival.

Hobo) just scraped into the final, with the S.F.S. Cessna, flown by Mr. Hancock, out of it by ten seconds—quite apart from those ten seconds by which its start had been delayed owing to a Puss Moth pilot's lack of visual acuity. The aerobatic panel was out, yet he landed right across the competitors' take-off run.

Everybody was particularly interested in the second heat. Not only was the Mew Gull in this (and giving an incredible start to Mr. Hall's Hillson Praga, the limit machine), but the Tipsy S, in the hands of Mr. Brian Allen, was flying in its first race. Unfortunately, the airscrew was not everything it should be, and this little machine was pulled out after one lap in order to give the rapidly overtaking field a little more air-space. The Praga held the lead for one lap, was then overtaken by Mr. Cliff's satisfactorily handicapped B.A. Swallow, and finally reached the final by a margin of twenty-seven seconds over Mrs. Macdonald's Hawk Major. Mr. Cliff held his lead until the end, though another half-mile would have put Mr. Du Port's Moth Major ahead. Capt. Percival covered three laps while the rest were covering one and a half, and obtained fourth place.

While Mr. Field-Richards Cubbed about the sky and F/O Clouston showed what *could* be done with the C.P. Club's Aeronca, Mr. K. K. Brown went out to look at the weather. In due course the rain partially ceased and the race was officially considered to be safe, though there were clouds almost sitting on the Capel hangar. With the Sparrow Hawk, the Cessna and the Hawk Major out of it, only the Hendy Hobo remained as a "fast" machine to compete with the Mew Gull, and even this, lapping at about 125 m.p.h., had completed a circuit before the Mew took off with a long run down what wind there was.

Meanwhile the Swallow was closing in on the Praga and all the Moths were bunching together, their places still unchanged. At the end of the second lap the Cub was still in the lead, the Swallow had overtaken the Praga and this, with two "ornery" Moths, a Major and a Tiger, came round in an almost solid phalanx to depart on the last lap.

The winner of the trophy, Mr. R. Grubb, beside the urge-provider of his Aeronca. (*Flight* photograph.)

At the finish the Aeronca came in thirteen seconds ahead of the Tiger, which had climbed from seventh place to second, with the Cub eight seconds after and with the Swallow five seconds after the Cub. Not much wrong with that. Capt. Percival scraped into seventh place by seven seconds.

The prizes were presented by Miss Jeanne de Casalis and the evening was devoted to worthy pastime of "trying each other's machine"—in conditions of next to no visibility. The boundary lights were flashing long before the Tipsy was wheeled in.

THE DEATH of LOUIS BLÉRIOT

IT is not every great designer of aeroplanes who has made his name by a daring feat of piloting, and who will be remembered in history as pilot rather than as designer. To future ages, as to the present time, Louis Blériot will always be the man who first flew the English Channel. In Britain the name of his rival, Hubert Latham, was well known, but few over here had ever heard of Blériot until the morning when he landed his little monoplane on the grass behind Dover Castle, on a spot now marked by a concrete silhouette of his machine. Immediately he became the hero of the hour, and sensational papers cried out that Great Britain was no longer an island "guarded by the inviolable sea." For once the sensational papers were nearly right.

M. Blériot at the time of his visit to England in 1929 for the celebrations marking the 20th anniversary of his channel crossing. (*Flight* photograph.)

M. Blériot was born in 1873 and in early life was connected with a firm which made headlamps for cars, and from this business he made a considerable profit. In 1900 he began to experiment with aeroplanes, and in the next nine years he spent some £20,000 on his experiments. In 1909 he established himself at Neuilly aerodrome, and it was there that he produced a monoplane in the next year. All through the pioneer period of flying Blériot was a foremost champion of the monoplane. For a long time he did almost more crashing than he did flying, but he never damaged himself to any important extent. He could get off the ground, but he could not control his machine in the air. At first he tried to copy Lilienthal, the glider, and to balance his aeroplane by moving his body about so as to shift the centre of gravity Then he adopted the principle of warping the wings, and made better progress.

In October, 1908, Blériot made his first notable flight. Starting from Toury, he flew fourteen kilometres to Artenay, landed, and then flew back. Next year he made a flight carrying two passengers, which was an unprecedented feat. The Osiris prize of 100,000 francs was then divided between him and Gabriel Voisin. In the same year Blériot exhibited his No. 11 model monoplane at the Paris Salon. It had a three-cylinder air-cooled 25 h.p. Anzani engine, which drove a two-bladed wooden tractor airscrew. The monoplane had a span of 28 feet, and when empty weighed only 484 lb.

In 1909 both Blériot and Latham decided to compete for the *Daily Mail* prize of £1,000 offered for the first flight across the Channel. Latham tried first, forced landed in the water, and was rescued. Blériot who was then aged 36, married, and the father of five children, was suffering from a burnt foot, as at the great Rheims meeting his machine had caught fire. He took No. 11 to Baraques, near Calais, and on July 25, a few days after Latham's failure, he got up at 2.40 a.m. and decided to make his attempt. The destroyer *Escopette* had been detailed to follow him, and Madame Blériot started off in it. Her husband climbed into his machine, and, having no compass, he asked the people round to point out the direction of Dover. He took off at 4.40 a.m. and soon passed the destroyer. His altitude varied between 150 and 300 feet. Soon he was out of sight of land and felt lost, but after a few more minutes found himself opposite St. Margaret's Bay. His engine showed signs of overheating, but a shower of rain cooled it. He turned towards Dover, but had difficulty in climbing over the cliffs. He succeeded after more than one attempt, and landed at 5.20 a.m., breaking his propeller and his undercarriage as he did so. His fortune was then made

Soon afterwards he gave up active flying and devoted himself to design and production. It was many years before he flew the Channel again, and his second flight was made as a passenger. His company has seen many ups and downs, but it has turned out many fine machines. For some time past he has suffered much from his heart, and his death last Saturday at the age of 63 was not unexpected.

FOURTEEN THOUSAND MILES in WEST AFRICA

Some Details of a Remarkable Survey Flight

THE airline potentialities of West Africa are constantly being examined and developed by more than one nation having interests in that area. With the object of assisting such opening up of the country, the Shell Company recently sent one of its representatives, Mr. W. K. Brett, on a lengthy air survey of all the landing grounds, whether they were properly equipped aerodromes, emergency clearings in the bush or merely possible sites; nor were seaplane anchorages neglected. In spite of the formidable opposition of bad weather, fever and other enemies of mankind in such districts, Mr. Brett carried out his task, and his report to the Company is, without exaggeration, a masterpiece of thoroughness. Consisting of some 80 closely typed foolscap pages, and illustrated with many photographs, plans and maps, it describes in detail the country flown over, and specifies—as will be seen from an example on the next page—the nature of each landing ground. The Company has had a certain number of duplicate copies made and the information thus made available should be of immense value to all who are at any time likely to require it. This article, actually, consists mainly of extracts from the Company's general introduction to the report, and from Mr. Brett's summing-up.

AS those who regularly study the Commercial Aviation Section of *Flight* will know, the question of running airlines through West Africa has been given much study by the various countries concerned. Actually, by the autumn of last year, not only were certain regular services in operation, but plans for opening-up additional routes were in a very advanced state, so that the following were either in operation or expected to begin in the near future:—

(1) *BELGIAN (Sabena).*—Service from Europe to Leopoldville *via* Gao and Fort Lamy. Extension of this service from Leopoldville to Elizabethville.

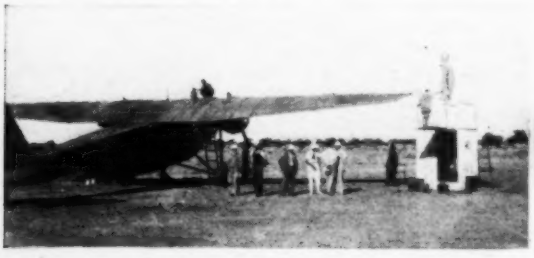
(2) *BRITISH (Imperial Airways (Nigeria and Gold Coast) Ltd.).*—Khartoum-Kano. Extension of this service to Lagos, and later to Accra and Takoradi in conjunction with Elders Colonial Airways.

(3) *FRENCH (Air Afrique).*—Service from Europe to Brazzaville *via* Gao and Fort Lamy, and extension to Elizabethville to connect with Madagascar line. *(Aeromaritime).*—Niamey-Cotonou, connecting with the through services of Sabena and Air Afrique. Service by amphibians along the coast from Dakar to Pointe Noire.

Mr. W. K. Brett and the "Shell" Percival Gull.

It is obvious that all these airlines are dependent for their services on efficient and adequate supplies of fuel and oil, and it is only by inspection on the spot that efficiency of supply can be ensured. For this reason the head office of the Shell Company in London decided that it was high time that a special visit should be paid to the area concerned to inspect existing facilities and investigate the necessity for extensions and improvements.

Now, the area in which these lines are operating or intend to operate includes part of French West Africa, Dahomey, Nigeria, Cameroons, French Equatorial Africa, and the Belgian Congo. If the tour of inspection was to be of value its results had to be available at an early date. Only by air could such a large area be visited in a reasonably short space of time. For some years the company has employed aeroplanes for similar, though generally shorter, tours of inspection. The nearest Shell aeroplane considered capable of carrying out such a tour, was the Percival Gull G-ADKX, of the Shell Company of Egypt at Cairo, where it had just replaced the Puss Moth G-ABJV, which for some years had been used for inspection work in the north-east quarter of the African Continent. Accordingly, it was determined that Mr. Brett, the company's pilot in Egypt, should undertake the proposed tour.



Seen on the trip: (Above) Refuelling a trimotor Bloch of Air Afrique at Zinder (French Niger Colony), and (right) a French Naval seaplane being refuelled at Duala, French Cameroons.

NIGERIA **KATSINA**

DECEMBER, 1935.

1. CLASSIFICATION.—Emergency landing ground.
2. CONTROLLING AUTHORITY.—Nigerian Government.
3. POSITION :—
   (a) *Latitude :* 13° N. *Longitude :* 7° 45′ E.
   (b) *Magnetic Variation :* *Date :* *Annual change :*
   (c) *Local (relative) Situation :* 1½ mile (2½ kms.) E. of Katsina Government Station.
   (d) *Height above Sea-level :* 1,800 ft. (549 metres).
4. LANDING AREA ;
   (a) *Main dimensions :* 667 × 667 yds. (600 × 600 metres).
   (b) *Surface conditions :* A week's notice if necessary to prepare ground for landings. Sandy level. Unmetalled track across aerodrome. Surrounding country open bush.
   (c) *Markings, Day :* Circle very indistinct.
   (d) *Markings, Night :* Nil.
   (e) *Landing and Take-off Zones (if specially defined) :* Not specified.
5. WIND INDICATION.—Smudge fire on arrival of aircraft.
6. NO-WIND LANDING DIRECTION.—Not specified.
7. OBSTRUCTIONS.—Few trees on N.E. corner.
8. LANDMARKS :—
   (a) *Day :* Katsina. Katsina-Kano road.
   (b) *Night :*
9. AERODROME CONTROL :—
   (a) *Position :*
   (b) *Signals :*
10. FACILITIES :—
   (a) *Service Station and Installations :* Nil.
   (b) *Fuel* } Aviation gasoline and lubricating oils avail-
   Oil } able at 14 days' notice.
   Water : Available.
   (c) *Accommodation :*
   Hangars : Nil.
   Hotels : Nil. Lodging only by previous arrangement.
   (d) *Repairs :* Workshops in Native City, 4½ miles distant.
   (e) *Medical :* Doctor and Hospital.
   (f) *Customs :*
11. COMMUNICATIONS :—
   (a) *Telephone :* In Katsina local only.
   (b) *Telegraph :* In Katsina.
   (c) *Radio :* Nil.
   (d) *Road :* Serviceable in all seasons, to Kano and Zalice.
   (e) *Railway :* Nil.
12. METEOROLOGICAL INFORMATION. — By Meteorological Officer.
13. CHARGES.—
14. REMARKS.—Harmattan frequent.

The data given in one of the many landing-ground schedules in the Shell report. Perhaps it is unnecessary to add that Katsina comes within the "emergency" category!

Much of the country over which the flight was scheduled to pass was wild and only partially explored, while part was over desert territory. The authorities in such countries naturally find it essential to have strict regulations in regard to air travel, so that they may ensure that aircraft unsuitable for the purpose are not used, that the pilot has adequate knowledge and suitable equipment for the journey, and that they themselves are safeguarded against undue expenditure on rescuing occupants of a machine which may have force-landed.

The part of this tour to which the most stringent regulations applied was the flight from Abeche-Fort Lamy over comparatively desert country.

First of all, in this area a *Contrat du Depannage* has to be produced. In some circumstances this may take the form of a contract with a local transport concern that they will undertake the recovery of the personnel if the machine is missing. Actually, in this section *depannage* by road is considered impossible between July and December; in other words, the rescue of a stranded party would have to be undertaken by the French Air Force. In this particular case the condition was met by means of an insurance policy guaranteeing to meet expenditure incurred by the French Government in rescue work up to a maximum of Fr. 100,000.

Secondly, a flight over this section must consist of at least two aeroplanes, though, as an exception, a single machine may be permitted to undertake the flight if a member of the crew has already been over the route at last twice, or if the machine is fitted with wireless. It was not practicable to fit the Percival Gull with wireless at the time, nor could sufficient load capacity be made available for wireless, but, after consideration of the pilot's previous experience of desert flying, the French authorities agreed to waive these stipulations.

Third, evidence had to be produced that arrangements had been made for supplies of fuel and oil without having to draw upon stocks belonging to the French authorities. The aeroplane had to carry, as a minimum, sufficient fuel and oil to enable it to cover the whole journey from Abeche to Fort Lamy against a head wind of 40 km./hr.

For each 400 km. of the journey between refuelling points, the machine had to be equipped with sufficient emergency rations for the personnel for two days and six litres of water per head.

Lastly, the aeroplane had also to be equipped with two smoke bombs; Very pistol and flares (red parachute flares are specified as preferable, but only ordinary signal cartridges could be obtained); firearm and twenty cartridges; and mooring equipment.

The question of permits was somewhat further complicated by the International Sanitary Convention. By the time the flight from Leopoldville towards Cairo could be undertaken, the various precautions against yellow fever, specified by the Convention, were in force in Nigeria and French territory, so that a return flight *via* Abeche could have been made as originally intended. It was, however, considered that the return through the Belgian Congo would be of more use for the purposes of the tour.

Carrying the Kit

Considerable thought had to be given to the fitting of the various articles of equipment into the aeroplane so that weight distribution should be satisfactory, and articles such as Very pistol and cartridges and smoke bombs should be within easy reach of the pilot. The water container—three gallons capacity—was made to fit the curved back of the pilot's seat, to which it was fastened by four bolts with butterfly nuts. The curved container might have proved convenient for fitting to the pilot's back if the Fates had decided that he should have a long desert tramp after a forced landing.

Some difficulty was experienced in obtaining suitable smoke bombs. None was available on the English market. Some were obtained from Paris, but these were large and heavy and the glass container which formed part of the bomb did not instill confidence. Eventually, suitable small light bombs were obtained from a military source. Both smoke bombs and Very pistol were found of use.

The following details regarding the loading of the Gull may be of interest:—

	lb.
Available load (C. of A.) when petrol and oil tanks are full (50 gallons and 3 gallons)	475
Less estimated weight exhaust extension (to carry exhaust gases clear of camera aperture)	5
NETT AVAILABLE LOAD	470
DETAILS OF LOAD.	
Pilot (Mr. Brett)	128
Pilot's suitcase with clothing, despatch case with books, documents and stationery	37
MACHINE EQUIPMENT.	
Tools and spares	19
Water (3 gallons) and container	34
Maps	8
Smoke bombs	3
Sandbags and picketing gear	4
Gun and ammunition	4
Very pistol and cartridges	8
Camera and fittings	2
Film packs	6
Spare tin of oil	10
Available for rations and Shelltox	7
Balance available for passenger and his kit	200
TOTAL	470

CONSUMPTION.—Fuel, 10 gallons per hour; oil, less than 1 pint per hour.

CRUISING SPEED.—Average, 120 m.p.h. ground speed.

Shell aviation gasoline and Aeroshell heavy oil used throughout.

(Cont. overleaf

As regards photography, a Kodak was adapted for Bowden-control shutter operation. While results obtained could not be considered sufficiently good for a really accurate survey, they did provide all the information necessary to enable plans of landing grounds to be drawn, and their position in relation to the nearest towns, or other main features, to be reasonably accurately located.

Work to be carried out during the tour included:—

(1) Inspection of existing refuelling facilities and equipment.

(2) Consideration of the placing of new equipment and storage sheds, recruiting of refuelling crews and provision of uniforms.

(3) Advice and instructions to agents on the refuelling of aircraft and the care and maintenance of equipment.

(4) Collection of data for aerodrome information and air-route schedules.

(5) Making contact with local authorities.

The detailed mileage schedule given in Mr. Brett's report shows a total of 14,018 miles flown from the start of the tour on October 20, 1935, to its conclusion on April 29, 1936. This, however, is the point-to-point mileage only. It ignores mileage flown when taking photographs, wasted mileage looking for landing grounds under harmattan conditions, about five hours flying in a rainstorm near M'Beya, and some ten short flights given at various points to administrative officials and agents' representatives.

A passenger taken from El Fasher to Geneina was the medical authority for Darfur Province of the Anglo-Egyptian Sudan, whose presence was somewhat urgently required at Geneina in order that he might decide certain details of the layout of facilities at that aerodrome, so as to ensure that this ground complied with the sanitary regulations.

Extension of Schedule

Although the tour was originally intended to last only for some two months, experience very soon showed that the time allowed was inadequate for the amount of work required at each individual place.

In addition, frequent delays were experienced in the northern part of the area visited through the harmattan, as at times this caused visibility to be practically nil. At other times, when it was just possible to fly, navigation when flying into the sun could only be done by looking backwards. In Dahomey, the Gaboon and elsewhere, tornadoes of much violence were experienced. Indeed, when arriving at Cotonou, it was found impossible to land at that point, owing to a tornado, and it was necessary to return 30 km. to a landing ground at Allada. On arriving there it was found that the electrical disturbances were so strong that all telegraph and telephone lines were out of action. Again, at Libreville, two days had to be spent on the ground while it thundered and flashed with lightning as it can do only in tropical regions. On arrival at Lagos an addition was made to the original schedule, in the form of a tour to the Niger Delta by sea to visit suitable alighting areas for the Aeromaritime service. This journey took three weeks. On returning north, a tyre burst when taking off at Maradi, which caused another three weeks' delay. Thus, when the Gull reached Bangui six weeks behind schedule the rainy season had set in, so that very often, through the Gaboon and back through the Belgian Congo, constant delay through bad weather was experienced. Therefore, on arrival at Elizabethville—which may be taken as the end of the tour proper—a period of over four months had elapsed since G-ADKX left Cairo.

Further delays occurred owing to weather on the return journey to Egypt. Leaving M'Pika after receipt of a promising weather report, Mr. Brett found that a rainstorm of such violence had blown up in the M'Beya area that not only was it impossible to land at M'Beya, but the various emergency grounds within about 100 miles of M'Beya were also completely obscured by heavy rain. Eventually, having almost run out of fuel, he effected a landing in the nearest area which was free of trees. Freedom of trees in North Rhodesia generally means swamp, and just before the machine came to rest it stood up on its nose in about a foot of water and mud. Unfortunately, one blade of the airscrew was bent. Minor damage was done to cowling and so on, but that to the airscrew was the only damage not repairable on the spot. Mr. Brett spent two nights in native huts, while relays of native messengers brought help from a mission station. M'Beya was reached by road, and here technical assistance was secured and also a lorry, by which G-ADKX was brought into the town without much further damage.

A new airscrew having arrived from England, the Gull was re-erected and ready to proceed north when an attack of fever laid the pilot low. However, in due time the return flight to Cairo was safely completed.

Standing Up to It

Mr. Brett reports that throughout the tour the Gipsy VI engine—which had received only a minimum of attention—never gave the slightest cause for anxiety. The Percival Gull, also, came fully up to expectations; not only had it a useful turn of speed, but a most satisfactory take-off at the high-level aerodromes met with from Elizabethville to Juba.

As already indicated, the atmospheric conditions were often most trying. Both aeroplane and personnel had to accommodate themselves to changes between the hot dry atmosphere of the northern regions and the extreme humidity along the coast. After an hour or two's flying over dense tropical forest and large, mysterious rivers, a pilot even with the utmost confidence in his engine begins to feel a desire to be supplied with, instead of a single-engined aeroplane, a multi-engined, Autogiro amphibian.

Even after travelling elsewhere in Africa—where hospitality is always generous—the extraordinary hospitality of the European population was most striking. It is true that the visitor by air may at times be a welcome distraction, but, even so, individuals of all nationalities went out of their way to do everything possible to make pleasant the stay of the pilot in their neighbourhood.

In the Back of Beyond

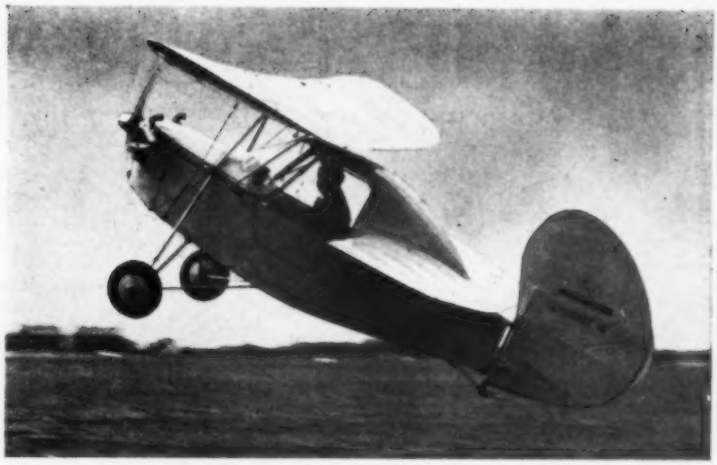
It is not surprising to find, in out-of-the-way spots, European men who prefer to seek their living in the less-known parts of the world rather than in the regulated atmosphere of a European town. But one cannot help but admire the wives who accompany them to the back of beyond. Take Mayumba, in the French Gaboon, as an example. Here there are three Europeans with their wives. These three ladies do their best to make life possible in a place which is exceedingly hot and humid, where there is no meat other than the perennial chicken, no locally grown fruit, while the main local vegetable is sweet potato. Once a fortnight a ship calls on its way from Pointe Noire to Libreville, communication with the shore being by surf boat. It is by no means unusual for the sea to be too rough even for surf boats, so the ship passes on and another fortnight has to go by without mail or any possibility of obtaining supplies of fresh fruit or vegetables.

Communication with the outer world is by telegraph line not infrequently put out of action by storms or forest denizens. To reach the nearest town—Pointe Noire—it requires four days' travelling by hammock either through the dense tropical forest or along the sea shore, where the glare of the sea is most painful to the eyes. After those four days there is still another half-day's journey by car before Pointe Noire can be reached.

It can readily be imagined how the inhabitants of places such as this welcome the opening-up of air-mail services, study with enthusiasm details of proposed airlines or feeder services, and do their very best to encourage their establishment and help their operation.

POUX at SPEED

French Pilots First and Third in Ramsgate Race : S. V. Appleby Second : Mignet Demonstrates His High-performance Machine



M. Mignet smiles at *Flight's* photographer as the H.M.18 leaps into the air.

NOT a few people when they heard of "The First International Flying Flea Trophy Race" were inclined to be pessimistic. "Huh—three starters, one finisher, and a job for the ambulance," was the usual sort of attitude.

Actually, last Monday's tale at Ramsgate airport was a very different one. Mr. Stephen Appleby had done his organising soundly and Mr. Whitney Straight—who operates the airport—had collected about him a most capable and cheery staff of officials to marshal the race and the supporting flying events. Add to this the fact that Messrs. Dancy and Rowarth, quite unperturbed by the unknown quantity

M. Bret, the winner; he used a 4-cyl. Ava two-stroke. (*Flight* photograph.)

x, were doing the handicapping, and you have the makings of a success.

Handsome prizes—the first was a challenge trophy and £100—had attracted eight competitors (of whom one was a non-starter), including three from France, under the fatherly eye of jovial Maestro Mignet himself.

In the flying display, which formed a curtain-raiser to the race, the demonstrators were: Messrs. Kronfeld (Drone), Kirwan (Aeronca), Shoesmith (Hillson Praga), Rogers (Swallow), Brie (Autogiro), Peatfield and Mouatt (Hornet) and Creasey (Scion), while Mr. W. G. Hire did a parachute drop from a Scion. But it was undoubtedly M. Mignet's demonstration of his new high-efficiency "H.M.18" *Pou* that pleased the big crowd most. The machine is the *monoplace* version of his still newer *biplace* "H.M.18" and, like that machine, has an enclosed cockpit. Most interesting of all is a deviation from *Pou* principles by the fitting of an elevator to the rear wing intended to act mainly as a trimming control.

Of small span, the H.M.18 has a 38 h.p. Mengin flat-twin four-stroke engine, but M. Mignet told us that he cannot, until he has evolved a more suitable wing section, use its full power in level flight. Even 30 h.p. gives him a speed of 100 m.p.h., while the climb is of the order of 1,200 ft./min. Certainly the performance is quite amazing to watch, and the general liveliness, climb and controllability of the machine, together with its long undercarriage legs, give an odd suggestion of a saucy little fighter. Mr. Appleby demonstrated his own original -ADMH at the same time, the purr of the Carden engine providing a contrast to the crackle of the twin.

The course for the race was over four laps of a seven-mile triangle with distant turns at Manston (where, said a competitor, half the R.A.F. was congregated on the aerodrome to watch the fun), and round the Corporation "destructor" chimney (ominous name!) within sight of home. Most of the engines started up well on the line — though F/O. Clouston's Scorpion did have to

(*Contd. on p.* 168.)

Messrs Dancy and Rowarth flag away the competitors.

THE FOUR WINDS

ITEMS OF INTEREST FROM ALL QUARTERS

PILOTS' PICNIC: The mess waiters provide a welcome interlude for pilots of No. 111 Squadron at Biggin Hill between interceptions in last week's air exercises. (*Flight* photograph.)

A GERMAN Academy of Aeronautical Research has been founded. It will have sixty full members and 100 associates.

A well-known figure in Spanish military and political circles, Gen. Jose Sanjuro, was killed in a flying accident near Lisbon on July 20.

Particulars of the Third International Egyptian Aviation Meeting, to be held in February, 1937, are obtainable from the R.Ae.C. The event was originally to have taken place last March.

General Aircraft have commenced delivery within the scheduled time of the Hawker Furies which they are building.

It is expected that the whole of the number ordered will be delivered before the end of this year. This is the first occasion on which this type has been placed in the hands of sub-contractors.

Twenty-five Years Ago

(*From "Flight" of August 5th, 1911.*)

"The new Voisin of the 'Canard' type, which has been built with a view to rising from and coming down on the water, made its appearance at Issy the other day. Its general design is the same as that of the now familiar 'Canard' type machine, except that it is equipped with four floats and a supplementary rudder under the forward end of the fuselage. One of the floats is placed in front, while the other three are disposed beneath the main planes."

Four British pilots, Messrs. Deterding (Falcon), Linnell (Hornet), Humble (Leopard), and Frogley (Stinson) took part in the Olympic Games Air Rally at Berlin last week.

Lord Sempill, who left England on Thursday, reached Jask (Persia) on Friday, but was forced to return there by bad weather.

Lord Sempill, who is flying the Monospar Croydon to Australia, landed at Karachi at 11.30 a.m. on Sunday, stating that he would stop for a few days while a damaged tail wheel was repaired.

Mr. H. A. Marsh demonstrated the Weir jump-start Autogiro at the Brooklands Bank Holiday car meeting.

A special exhibition dealing with the history and development of Britain's Air Forces is now in progress at the Royal United Service Museum in Whitehall.

The Queensland Government is to purchase two more aircraft to add to the "flying doctor service" which has been operating so successfully in various parts of Australia.

After completing a normal jump and folding his parachute, a Russian parachutist fell asleep on the flying field and all efforts of doctors and scientists have failed to waken him.

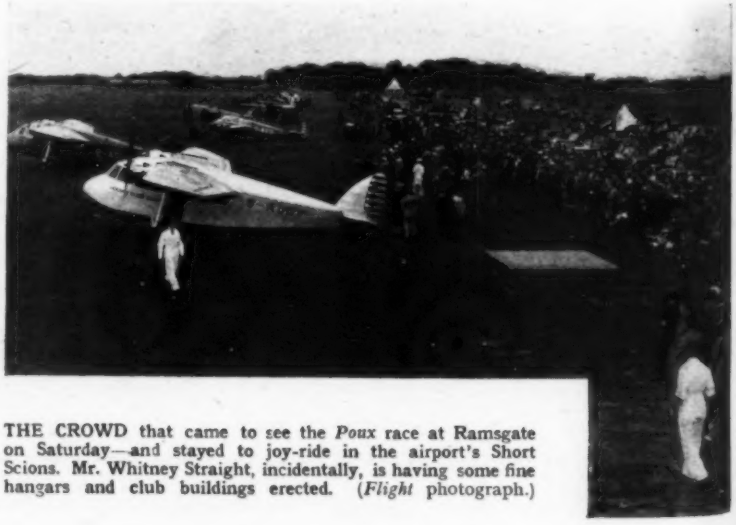
Air Chief Marshal Sir Robert Brook-Popham, Inspector General of the R.A.F., accompanied by his staff, arrived in Cyprus last Thursday in a Vickers Valentia for a five days' air survey of the island.

The trustees of the Busk Studentship in Aeronautics, founded at Cambridge University in memory of Edward Teshmaker Busk, have awarded the studentship for the year 1936-37 to J. W. E. Clarke, B.Sc., Glasgow.

In the King's Bench Division last week an apprentice who lost an arm while swinging an airscrew was awarded £5,000 damages against the pilot, Mr. W. H. Corry, and Gravesend Aviation, Ltd.

Mr. Justice Greaves-Lord held that the accident was due to a misunderstanding between the pilot and the apprentice which led to the pilot switching on before he was given the word "contact."

It was contended on behalf of Gravesend Aviation, Ltd., that judgment should not be entered against them having regard to a clause in the apprenticeship deed. Legal arguments followed, and judgment was reserved until next term.



THE CROWD that came to see the *Poux* race at Ramsgate on Saturday—and stayed to joy-ride in the airport's Short Scions. Mr. Whitney Straight, incidentally, is having some fine hangars and club buildings erected. (*Flight* photograph.)

THE ROYAL AIR FORCE

SERVICE NOTES AND NEWS — AIR MINISTRY ANNOUNCEMENTS

PASSING OUT AT HALTON

Last Tuesday, July 28, Air Vice-Marshal Freeman, C.B., D.S.O., M.C., inspected No. 1 School of Technical Training (Apprentices) at Halton on the occasion of the passing out of the 28th entry. The following are extracts from the report of the Commandant:—

Of the 242 originally attested, sixty were posted to the Electrical and Wireless School, Cranwell, for training as Electricians and Wireless Operator Mechanics. Casualties from sickness and other causes during the three years amounted to nineteen, while eight apprentices were transferred to this entry from senior entries, leaving 171 now to pass into the service.

As the result of the final examination, thirteen have been classified as leading aircraftmen, 140 as aircraftmen 1st class, and sixteen as aircraftmen 2nd class. One apprentice failed to qualify.

I am of the opinion that the present entry will be found superior to previous entries in the practical application of their knowledge.

The programme of working hours which allows of two afternoons a week being allocated to organised games continues to work well. It has resulted in a general improvement in the physical fitness of aircraft apprentices.

In this connection, it is of great interest and pride to Halton to note that P/O. D. O. Finlay has been selected as captain of the British team at the forthcoming Olympic Games in Berlin. P/O. Finlay passed out from Halton as an aircraftman 1st Class with the September, 1925, entry.

PRIZE WINNERS

1st Grand Aggregate:—Sergt. Apprentice Alfred Edward Neal.
2nd Grand Aggregate:—Corpl. Apprentice John Lawrence Crowe.
3rd. Grand Aggregate:—Sergt. Apprentice Charles Victor David Willis.
Educational Subjects:—Sergt. Apprentice Willis.
1st Fitter II:—Sergt. Apprentice Neal.
Elliott Memorial Prize:—Sergt. Apprentice Willis.
Cadetships:—Leading Apprentice Lambert, Aircraft Apprentice Barnard, Sergt. Apprentice Petre, Sergt. Apprentice Willis.
Viscount Wakefield Scholarship:—Sergt. Apprentice Willis.

NOMENCLATURE OF AIRCRAFT

The name of the Hawker single-seater fighter aeroplane fitted with Merlin engine is Hurricane I.

FORMATION OF STATION FLIGHT

A station flight formed at Tern Hill on July 10.

FORMATION OF STATION HEADQUARTERS

A station headquarters formed at Cranwell on July 10.
A station headquarters formed at Halton on July 10.

COMMISSIONS FOR WARRANT OFFICERS

The undermentioned warrant officers have been granted permanent commissions:—

As Commissioned Armament Officers.—L. A. Bett and A. J. Richardson.

As Commissioned Signals Officers.—F. W. Jenkins, A. W. Coe, and F. W. G. Aggett.

As Commissioned Engineer Officers.—W. H. King, A. J. Nicholas, J. K. Tough, J. C. Steadman, C. T. McKnight, A. C. Oatway, E. L. Magrath, and H. R. Clowes.

FORMATION OF No. 66 (FIGHTER) SQUADRON

No. 66 (Fighter) Squadron formed at Duxford on July 20 and has been placed under the command of the A.O.C.-in-C., Fighter Command, in No. 11 (Fighter) Group.

ROYAL AIR FORCE COMMAND, CRANWELL

A new order lays it down that Royal Air Force, Cranwell, as at present constituted will become a formation, with the status of a group, in the Training Command.

REORGANISATION OF CATAPULT UNITS IN THE FLEET AIR ARM

With effect from July 15 the aircraft of the Fleet Air Arm carried in capital ships and cruisers were reorganised as follows:—

Aircraft carried in ships of the 1st Battle Squadron became No. 701 (Catapult) Flight.
Aircraft carried in ships of the 2nd Battle Squadron became No. 702 (Catapult) Flight.
Aircraft carried in ships of the Battle Cruiser Squadron became No. 705 (Catapult) Flight.
Aircraft carried in ships of the 1st Cruiser Squadron became No. 711 (Catapult) Flight.
Aircraft carried in ships of the 2nd Cruiser Squadron became No. 712 (Catapult) Squadron.
Aircraft carried in ships of the 3rd Cruiser Squadron became No. 713 (Catapult) Flight.
Aircraft carried in ships of the 4th Cruiser Squadron became No. 714 (Catapult) Flight.
Aircraft carried in ships of the 5th Cruiser Squadron became No. 715 (Catapult) Squadron.
Aircraft carried in ships of the 6th Cruiser Squadron became No. 716 (Catapult) Flight.
Aircraft carried in ships of the 8th Cruiser Squadron became No. 718 (Catapult) Squadron.
Aircraft carried in ships of the New Zealand Division became No. 720 (Catapult) Flight.

It is essential to the new organisation that the R.A.F. organisation of the aircraft should be coincident with the naval organisation of H.M. ships. Consequently when a ship is transferred from one naval formation to another, the transfer of the aircraft, personnel and maintenance stores to the appropriate flight or squadron will be carried out automatically and without further instructions from the Air Ministry (*e.g.* if H.M.S. *Neptune* is transferred from 2nd Cruiser Squadron to 3rd Cruiser Squadron the aircraft carried in the ship will be transferred automatically from No. 712 (Catapult) Squadron to No. 713 (Catapult) Flight. All vouchers, inventories, etc., held by the R.A.F. Station, Mount Batten, or by Coastal Command will be transferred immediately to the R.A.F. Station, Calafrana, or to the Mediterranean Command as appropriate. The Mediterranean Command will assume all administrative and maintenance responsibilities, and all returns from H.M.S. *Neptune* will be forwarded to the Admiral Commanding 3rd Cruiser Squadron or to the R.A.F. Base, Calafrana, or to Mediterranean Command Headquarters, as appropriate).

When a ship belonging to a foreign station returns to home waters for any purpose and is not transferred or attached to a naval squadron in home waters, the aircraft and personnel will be regarded as detached from their flight or squadron to the R.A.F. Station, Mount Batten, or to the R.A.F. Station, Lee-on-the-Solent, as ordered by the A.O.C., Coastal Command.

ROYAL AIR FORCE GAZETTE

London Gazette, July 28, 1936

General Duties Branch

Sqn. Ldr. H. N. Thornton, M.B.E., is granted the acting rank of Wing Commander (unpaid) (July 21).

The following Flight Lieutenants are granted permanent commissions in this rank (June 1):—F. W. H. Hall, A. McKee.

The following are granted short service commissions as Acting Pilot Officers on probation with effect from and with seniority of July 13:—J. Avent, H. R. Bickerstaff, J. B. J. Boardman, G. R. Brady, D. F. H. Brown, H. D. Card, S. G. Cooper, R. C. Cox, D. T. St. H. Dawes, A. A. Devany, J. Ellis, S. Gemmell, R. S. Illingworth, R. B. Langlois, A. M. McKenzie, A. C. MacLachlan, H. G. Marriott, F. T. May, S. C. Pendred, T. G. Robertson, G. F. Rodney, D. D. Rogers, G. E. Saddington, J. M. W. Savory, K. M. W. Savory, W. S. L. Smallman, D. C. Stapleton, P. B. Unitt, G. P. Westropp-Bennett, E. T. Williams.

The following Flying Officers are promoted to the rank of Flight Lieutenant with effect from the dates stated:—J. G. G. Moore (April 18); C. J. Giles (seniority April 1) (June 19).

The following Pilot Officers are promoted to the rank of Flying Officer with effect from the dates stated:—C. C. Hodder (June 7); F. M. Smith (June 15); F. J. Manning (June 22).

The following Flight Lieutenants are transferred to the Reserve, Class A, on the dates stated:—P. R. J. Leborgne (July 20); J. F. L. Zorn (July 21); V. G. Govett (July 22); W. M. Hargreaves (July 27); G. V. T. Thomson (July 27).

The short service commissions of the following Acting Pilot Officers on probation are terminated on cessation of duty (July 17):—D. C. Hughmore Copping, J. Walmisley.

Stores Branch

F/O. I. Lloyd is cashiered by sentence of General Court Martial (July 9).

Medical Branch

E. J. Moynahan, M.R.C.S., L.R.C.P., is granted a short service commission as a Flying Officer with effect from July 8 and with seniority of May 25; Flt. Lt. J. F. S. Wiseman, M.B., Ch.B., is transferred to the Reserve, Class D (July 23).

Dental Branch

F/O. K. G. Swiss, L.D.S., is promoted to the rank of Flight Lieutenant (July 1).

Chaplains Branch

G. M. Rees is granted a short service commission with the relative rank of Squadron Leader with effect from and with seniority of July 20.

ROYAL AIR FORCE RESERVE

Reserve of Air Force Officers

General Duties Branch

F. B. Young is granted a commission as Flight Lieutenant in Class C (July 1); C. M. Harris is granted a commission as Pilot Officer in Class C (July 9); F/O. W. MacK. R. Griffin is transferred from Class A to Class C (June 27); F/O. L. G. O. Hutchison is transferred from Class AA (i) to Class C (May 29). The notification in the *Gazette* of October 29, 1935, concerning F/O. H. E. Sales is cancelled. P/O. R. J. Falk resigns his commission (April 19).

The following Flying Officers relinquish their commissions on completion of service:—C. T. E. Smith (March 6); C. E. Powell (June 25); K. Shenstone (June 27).

Medical Branch

C. W. Flemming, M.R.C.S., L.R.C.P., B.M., B.Ch., F.R.C.S., M.Ch., D.M., is granted a commission as Squadron Leader in Class D.D. (July 14); A. Ronald, M.D., F.R.C.S., is granted a commission as Flying Officer in Class D.D. (July 1).

SPECIAL RESERVE

General Duties Branch

The following resign their commissions on the dates stated consequent on the conversion of the Special Reserve to the Auxiliary Air Force:—Flt. Lt. B. A. Hewett (May 1); Flt. Lt. M. M. Hutchinson (May 18); Flt. Lt. G. B. Iles (May 25); Flt. Lt. C. N. Shaw (May 1); Flt. Lt. R. H. Watson (May 18); F/O. A. P. Anderson (May 25); F/O. R. W. Harker (May 18); F/O. W. B. A. J. Keppel, F/O. W. K. Le May (May 25); F/O. A. D. Pickup (May 1); F/O. W. B. Royce (May 18); F/O. M. A. Smith (May 1); F/O. J. F. Spanton (May 25); F/O. J. A. C. Warren (May 1); P/O. G. Greaves (May 18); P/O. P. Green (May 25); P/O. C. E. Malfroy (May 1); P/O. J. A. F. Mertens, P/O. J. B. Parnall, P/O. J. C. Reynolds (May 18); P/O. R. H. Smith, P/O. N. L. Westbury-Jones (May 1).

Medical Branch

The following resign their commissions on the dates stated consequent on the conversion of the Special Reserve to the Auxiliary Air Force:—Flt. Lt. F. G. Mogg, M.R.C.S., L.R.C.P. (May 1); Flt. Lt. R. H. Vartan, M.B., Ch.B. (May 18).

AUXILIARY AIR FORCE

General Duties Branch

No. 500 (COUNTY OF KENT) (BOMBER) SQUADRON.—The following are granted commissions in the ranks stated with effect from May 25 and with seniority of the dates shown:—Flt. Lt. G. B. Iles (July 29, 1935); F/O. W. K. Le May (April 18, 1933); F/O. W. B. A. J. Keppel (October 28, 1935); F/O. J. F. Spanton (January 23); F/O. A. P. Anderson (March 29); F/O. P. Green (November 30, 1935).

No. 501 (COUNTY OF GLOUCESTER) (BOMBER) SQUADRON.—The following are granted commissions in the ranks stated with effect from May 1 and with seniority of the dates shown:—Flt. Lt. B. A. Hewett (May 1, 1933); Flt. Lt. C. N. Shaw (February 24); F/O. A. D. Pickup (November 11, 1933); F/O. J. A. C. Warren (May 29, 1935); P/O. C. E. Malfroy (May 1); P/O. N. L. Westbury-Jones (May 1).

No. 503 (COUNTY OF LINCOLN) (BOMBER) SQUADRON.—The following are granted commissions in the ranks stated with effect from May 1 and with seniority of the dates shown:—F/O. M. A. Smith (October 22, 1935); P/O. R. H. Smith (May 1, 1935).

No. 504 (COUNTY OF NOTTINGHAM) (BOMBER) SQUADRON.—The following are granted commissions in the ranks stated with effect from May 18 and with seniority of the dates shown:—Flt. Lt. M. M. Hutchinson (May 29, 1933); Flt. Lt. R. H. Watson (October 31, 1935); F/O. W. B. Royce (December 4, 1933); F/O. R. W. Harker (February 1, 1933); P/O. J. A. F. Mertens (May 18); P/O. G. Greaves (May 18); P/O. J. B. Parnall (May 18); P/O. J. C. Reynolds (August 16, 1935).

Medical Branch

No. 501 (COUNTY OF GLOUCESTER) (BOMBER) SQUADRON.—F. G. Mogg, M.R.C.S., L.R.C.P., is granted a commission as a Flight Lieutenant with effect from May 1 and with seniority of May 1, 1930.

No. 504 (COUNTY OF NOTTINGHAM) (BOMBER) SQUADRON.—R. H. Vartan, M.B., Ch.B., is granted a commission as Flight Lieutenant with effect from May 18 and with seniority of April 19, 1934.

ROYAL AIR FORCE INTELLIGENCE

Appointments.—The following appointments in the Royal Air Force are notified:—

General Duties Branch

Air Commodore.—A. G. R. Garrod, O.B.E., M.C., D.F.C., to Headquarters, No. 23 (Training) Group, Grantham, on appointment as Senior Air Staff Officer, 10.7.36.

Wing Commanders.—C. Turner, A.F.C., to Headquarters, Training Command, Market Drayton, for Equipment (Engineer) Staff duties, 10.7.36. P. B. Hunter, to Headquarters, Bomber Command, Uxbridge, for Equipment (Engineer) Staff duties, 14.7.36. W. R. Cox, M.C., A.F.C., to Headquarters, Bomber Command, Uxbridge, for Armament duties, 14.7.36. R. J. Mounsey, O.B.E., to Headquarters, Bomber Command, Uxbridge, for Equipment (Engineer) Staff duties, 14.7.36. F. H. Laurence, M.C., to Headquarters, No. 2 (B) Group, Abingdon, for duty as Senior Personnel Staff Officer, 14.7.36. P. H. Cummings, D.F.C., to Headquarters, No. 2 (B) Group, Abingdon, for Air Staff duties, 14.7.36. C. A. Stevens, M.C., to Headquarters, No. 11 (F) Group, Uxbridge, for Air Staff duties, 14.7.36.

Squadron Leaders.—J. W. Jean, D.S.M., to Headquarters, Training Command, West Drayton, for Equipment (Engineer) Staff duties, 10.7.36. P. M. McSwiny, to Headquarters, No. 23 (Training) Group, Grantham, for Armament duties, 10.7.36. G. S. Oddie, D.F.C., A.F.C., to No. 23 (Training) Group, Grantham, for Air Staff duties, 10.7.36. G. H. Harrison, D.F.C., to Headquarters, Bomber Command, Uxbridge, for Navigation duties, 14.7.36. R. L. Ragg, A.F.C., to Headquarters, Bomber Command, Uxbridge, for Navigation duties, 14.7.36. S. J. Smetham, to Headquarters, Bomber Command, Uxbridge, for Photographic duties, 14.7.36. V. E. Groom, D.F.C., to Headquarters, Bomber Command, Uxbridge, for Air Staff duties, 14.7.36.

Flight Lieutenants.—J. A. S. Outhwaite, to Headquarters, Training Command, Market Drayton, 10.7.36. G. M. Buxton, to No. 800 (F.F.) Squadron, 19.6.36. J. H. Hutchinson, to No. 823 (F.S.R.) Squadron, 7.7.36. C. V. J. Pratt, to Headquarters, No. 2 (B) Group, Abingdon, 14.7.36. A. R. Sarel, to No. 21 (B) Squadron, Abbotsinch, 18.7.36.

Pilot Officer.—E. R. Bitmead, to No. 43 (F) Squadron, Tangmere, 17.7.36.

Stores Branch

Wing Commander.—H. L. Crichton, M.B.E., to Headquarters, Bomber Command, Uxbridge, for Equipment (Stores) Staff duties, 14.7.36.

Squadron Leaders.—C. H. Masters, to Headquarters, Training Command, Market Drayton, for Equipment (Stores) Staff duties, 10.7.36. W. A. Glasper, to Headquarters, Bomber Command, Uxbridge, for Equipment (Stores) Staff duties, 14.7.36. A. Walters, to Headquarters, Bomber Command, Uxbridge, for Equipment (Stores) Staff duties, 14.7.36. V. B. Ranford, to Headquarters, Bomber Command, Uxbridge, for Equipment (Stores) Staff duties, 14.7.36.

Flight Lieutenants.—C. J. Nobbs and W. G. S. Wood, to Headquarters, Training Command, Market Drayton, 10.7.36.

Accountant Branch

Squadron Leaders.—P. J. Farmer, to Headquarters, Bomber Command, Uxbridge, for Accountant duties, 14.7.36. W. E. Fisher, M.C., to Headquarters, Bomber Command, Uxbridge, for Accountant duties, 14.7.36.

Flying Officer.—J. G. Wigley, to Headquarters, Bomber Command, Uxbridge, 16.7.36.

Medical Branch

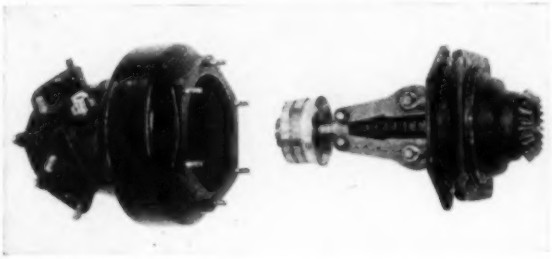
Wing Commanders.—T. Montgomery, to Headquarters, Bomber Command, Uxbridge, for duty as Deputy Principal Medical Officer, 14.7.36. A. E. Barr-Sim, to Headquarters, Bomber Command, Uxbridge, for duty as Medical Officer, 14.7.36. E. C. K. H. Foreman, to Headquarters, Training Command, Market Drayton, for duty as Medical Officer, 20.7.36.

Squadron Leaders.—R. L. C. Fisher, to Headquarters, Bomber Command, Uxbridge, for duty as Medical Officer, 14.7.36. R. W. White, to Superintendent of the Reserve, Hendon, for duty as Medical Officer, 14.7.36.

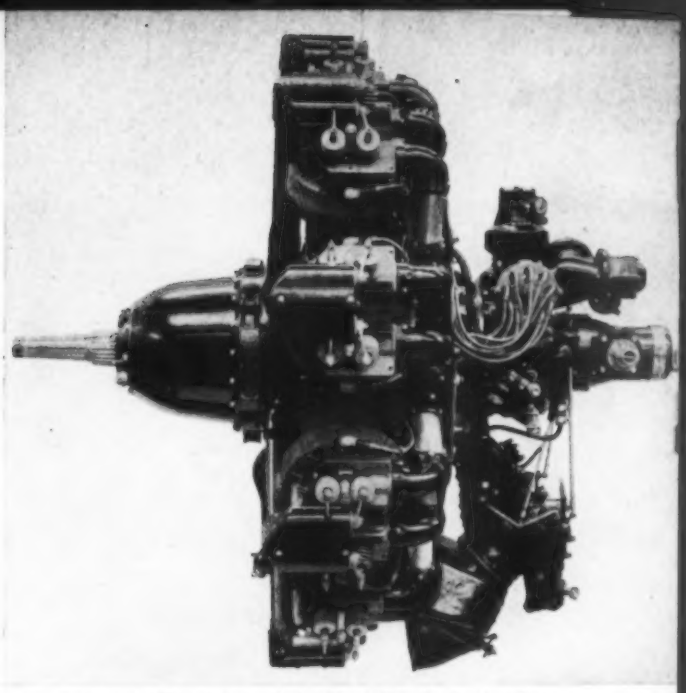
Flying Officers.—E. J. Moynahan, to No. 3 Flying Training School, Grantham, on appointment to a short service commission, 8.7.36. W. J. Fowler, to R.A.F. Station, Hucknall, 20.7.36.

STILL HIGHER EFFICIENCY

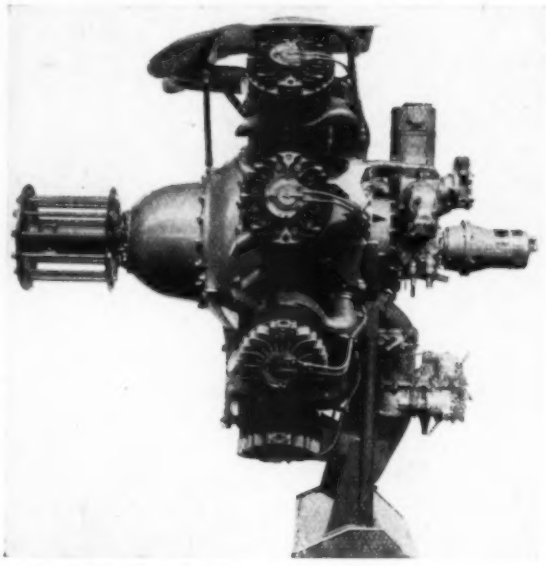
Some of the Improved Bristol Engines and New Components described in "Flight" of July 23



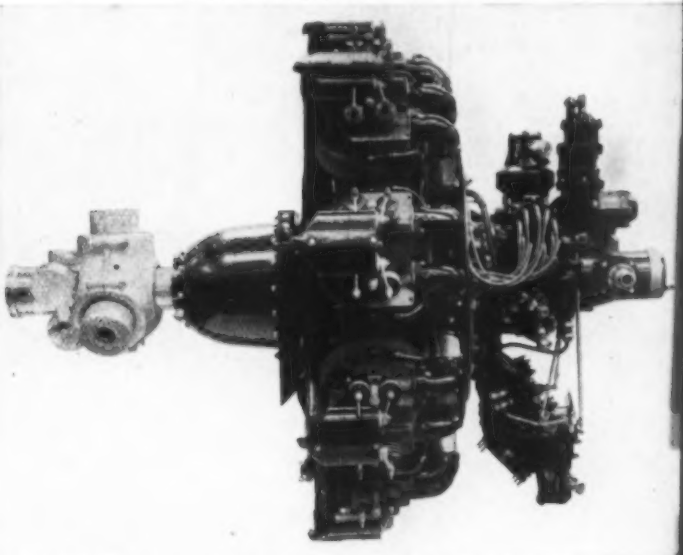
The automatic advance gun gear control. As engine speed increases, the centrifugal governor advances the timing cams to counteract the operational lag of the synchronising gear. The gear meets demands imposed by three-bladed airscrews, accelerated rate of fire and higher engine speeds



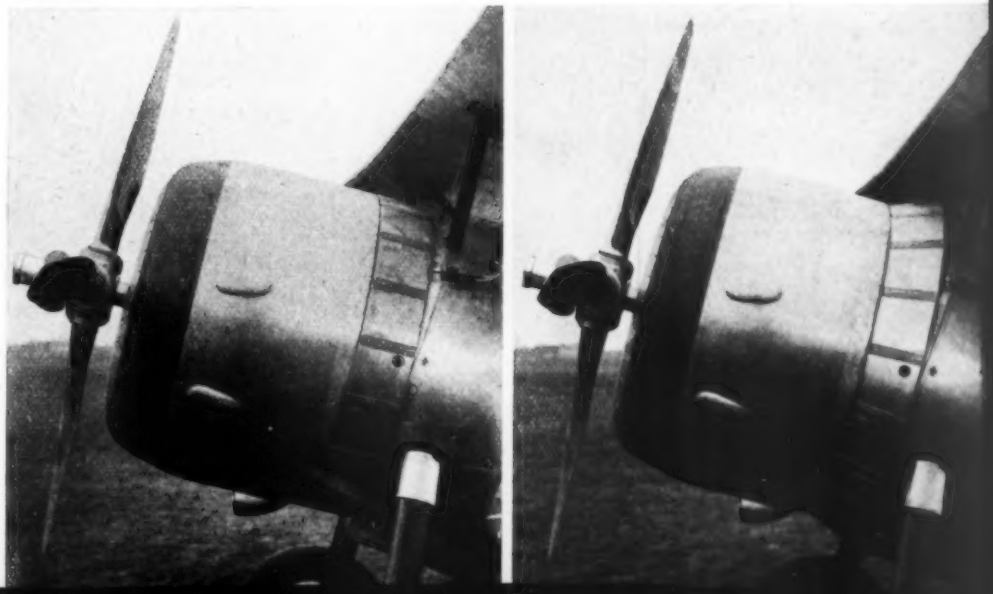
Similar to the Xc engines of the Short Empire boats, the latest Pegasus X gives take-off power of no less than 960 h.p. —well over 100 h.p. per cylinder



(Above) The Perseus sleeve-valve engine, showing a section of the nose-type exhaust collector ring which is combined with the N.A.C.A. cowling.



Mercury VIII engine with hub for De Havilland V.P. airscrew. This is the engine for the new Blenheim medium bomber. The maximum power is 840 h.p. at 14,000 ft.



(Right) The new Bristol controllable cowling closed and open. The installation illustrated is on the Mercury engine of a Bulldog IV single-seater fighter used for experimental work.

ROUND the W

Some Striking Pictorial C
Aviation in Five Cou

The famous French pilot Detroyat with the new Morane Saulnier 405 fighter, which has the very latest Hispano Y *canon* engine

Dawn o
a fine
German
school -
which,
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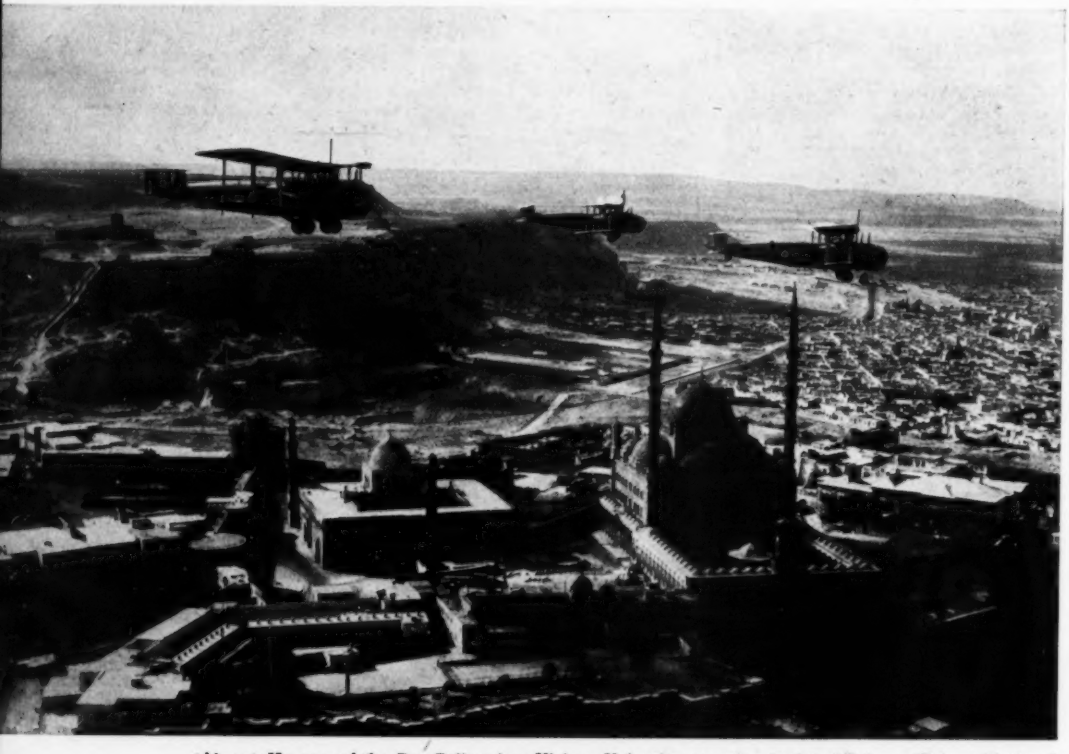


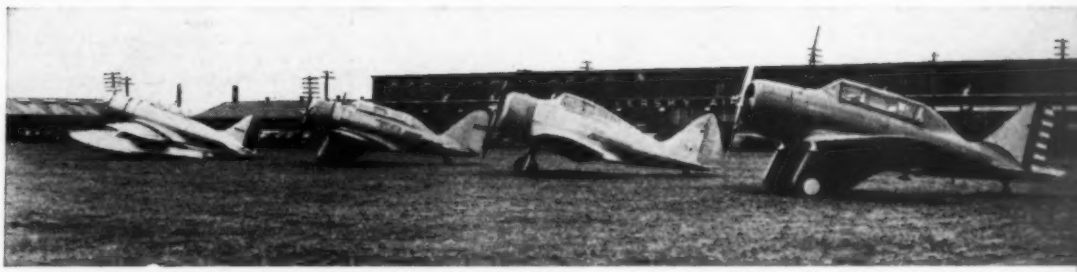
(Above) Keepers of the *Pax Britannica* : Vickers Valentias over the citadel of Cairo. (Below) National costumes and training methods at the Japanese State Flying School.

"Static" parachute training at
U.S.A. The canopy is held open
seen at the t of the tow

the WORLD

Pictorial Glimpses of in Five Countries

Dawn over the North Sea: a fine impression from a German seaplane training school — the identity of which, incidentally, is wrapped in mystery.



Four Seversky models gathered together at Farmingdale, Long Island, U.S.A., illustrate the persistence of the family likeness. From left to right are the new amphibian two-seater fighter (three of these have already been delivered to the Colombian Government); a landplane version of the machine on which Major de Seversky, its designer, established the world's amphibian speed record with 230.03 m.p.h.; the 1,000 h.p. Twin-Wasp-powered fighter ordered in quantity by the U.S. Army Air Corps; and the basic trainer for the same service.

(Below) Another striking photograph from the German seaplane school.

...ute training at New Jersey, ...opy is held open by the ring ... the top of the tower.

PERSONAL INSURANCE

Most Companies Now Willing to Give Cover Against Flying Risks

THERE can be no doubt that some form of personal accident insurance is desirable to all who engage in aviation, whether professionally or for sport. The matter is one which will certainly repay investigation, and as enquiries into it will not place one under any obligation the whole question is well worth going into, provided that a reputable company is chosen.

Policies are now issued in respect of pilots, navigators, engineers, mechanics and wireless operators, and the compensation payable is based on a fixed scale. This scale comprises benefits of (1) a capital sum in case of death; (2) a similar sum where there is loss of two limbs or the sight of both eyes, or one limb *and* the sight of one eye; (3) loss of one limb *or* the sight of one eye, (4) an annual payment limited to twenty years in the case of permanent total disablement caused other than by loss of sight or limbs; and (5) weekly payments limited to twenty-six weeks in the case of temporary total disablement. Typical benefits are as follows; in the case of (1) £2,000. (2) £2,000, (3) £1,000, (4) £100 per annum, and (5) £7 per week.

If it is not desired to take out a policy covering all the above benefits it is possible to have a policy covering only one, or any combination of benefits.

Questions to be Answered

Before such a policy can be issued, of course, it is necessary to complete and sign a form of proposal which is readily obtainable from any of the companies transacting this class of business. This form contains questions regarding the physical health of the proposer, particulars as to his licence, nature of flights intended and estimated number of flying hours in the proposed year of insurance, geographical limits of flights, previous flying experience (including records of any accidents) and whether he intends during the currency of the policy to use types of aircraft to which he has previously been accustomed

As it stands, the policy will exclude such forms of aviation as night flying, aerobatics and the first flight of an aircraft after construction, reconstruction or alteration, but on payment of an additional premium these risks can usually be covered. This also applies to the flying of aircraft embodying experimental features, competition flying or racing, and in all these cases full particulars must be submitted and the insurance company's consent obtained before the actual flight is carried out

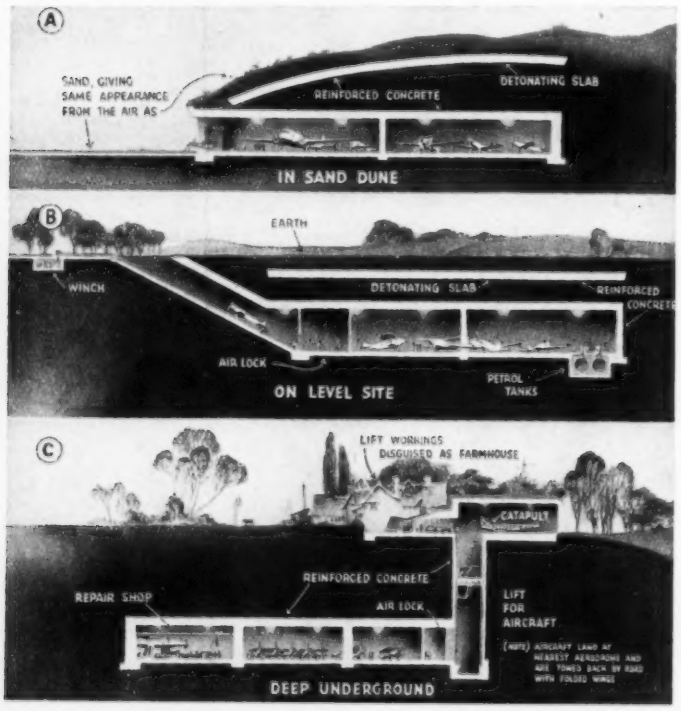
In the case of a person who merely intends to act as a fare-paying passenger on a recognised air service, personal accident cover may be obtained at a much lower rate of premium. For similar benefits to those quoted above the premium is usually somewhere about 1s. per cent. per day, and the only restrictions which apply are those relating to intentional self injury, suicide, war, usurped power or invasion.

Airline Travel

It is usual for aviation to be excluded from the everyday form of personal accident insurance, but if such a policy-holder intends to travel as a fare-paying passenger by a recognised air service anywhere in Europe, this risk can be included in the policy provided that the insurance company is previously advised of the policy-holder's intention, and on payment of the appropriate extra premium. Such policy-holders who fly other than as fare-paying passengers are well advised to see their insurance companies and make provisions for personal accident cover whilst flying, as this form of aviation will most assuredly be excluded from the scope of policies of the usual kind.

With regard to life policy-holders, most companies make a point of issuing their policies free from restrictions as to travel, occupation or residence, but in every case it is most advisable to make enquiries and get the company's answer in black and white. This is not intended to be in any way derogatory to the integrity of the insurance companies, but it may happen that your enquiry is made to an employee with but a hazy idea of the company's procedure with regard to aviation and life assurance. If the answer is by letter, you can be sure that the matter was dealt with in the right quarter before the letter was written.

ROBERT CLARE.



The Cement and Concrete Association's drawing showing suggested types of underground hangars: (A) Where there is rising ground adjoining the aerodrome, or in coastal sand dunes for seaplanes. (B) For normal aerodromes. (C) For frontier defence in difficult country.

CONCRETE FACTS

THE accompanying illustration—suggestions for types of bombproof underground hangars—is from a brochure entitled "Concrete in Aerodrome Construction" recently issued by the Cement and Concrete Association.

As will be seen, three different types are shown, varying degrees of defensive deception being a feature in each case.

Salient features of the brochure include comments on site selection, the wisdom of acquiring ample land at an early date, preparation of landing area, drainage, aerodrome markings, fencing, aprons, runways, roads and car parks, and buildings. The probability of the hard-surfaced runway being adopted as a solution to the increasing problem of providing sufficient space within easy reach of cities is stressed. The theory of the runway system is explained, and instructions are given on the best methods of laying permanent concrete runways.

Individuals, companies or official bodies who are contemplating the establishment of aerodromes may obtain copies on application to the Association, whose offices are at 52, Grosvenor Gardens, London, S.W.1.

REALLY RAPID RIVETING

The Chobert System Explained: 1,200 *Rivets per Hour*

METAL construction of aircraft, and particularly the speed with which small components can be joined together, had become a matter of first-rate importance, even before the expansion of the R.A.F. During the expansion, time-saving is even more necessary, and anything which tends to reduce the period required for constructing an aeroplane merits careful consideration.

Such a time-saver appears to be available in the Chobert automatic hand-operated riveter, which uses hollow rivets made of any desired material, and which is no untried "paper scheme," having been thoroughly tested in France over several years. The designer—one might almost say the inventor—is Monsieur Chobert, who has made a speciality of joint-making in metal, and who was, before entering the aeronautical field, a gunsmith accustomed to very accurate workmanship. His experience in that direction is clearly reflected in the "rivet gun" (the expression comes to mind irresistibly), which is a beautifully made piece of mechanism apart from being so simple in operation that, literally, a child can work it.

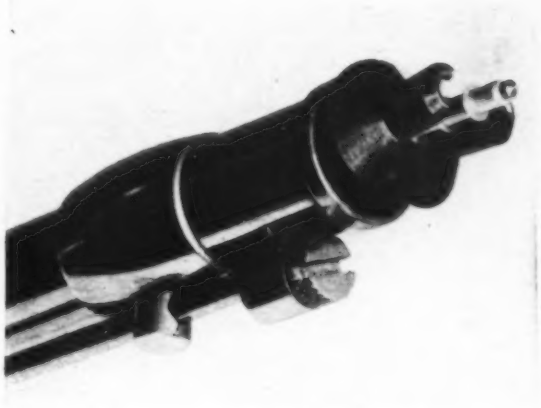
The sole British rights in the Chobert riveting process are held by Aviation Developments, Ltd., Argyle House, of 29-31, Euston Road, London, N.W.1. The rivet gun is not sold, but is hired out to users at a gradually diminishing annual rate; the rivets themselves are sold by the concessionaires.

Before describing the Chobert riveting machine it is necessary to explain the type of rivet used with it. The Chobert rivet is, as already stated, of the tubular type, with an internal lip at the end opposite to the rivet head. When a cone-shaped mandrel is drawn through the rivet it forces the flanged projecting part of the rivet outwards to form a shoulder which bears on the sheet to be riveted, as shown in the diagrams.

Action of the "Gun"

Regarding the Chobert riveter as a gun, it is necessary to realise that the long pin which carries the rivets, and on the forward end of which the mandrel is formed, is secured to the "stock" of the gun, while the "barrel" is moved forward by a cam operated by handle-driven gears and returned by a strong spring. Thus in operation the rivet pin is stationary, but the barrel moves forwards and backwards; the relative movement of the gun "muzzle" over the mandrel end of the pin is made to perform the riveting operation, and also to feed the next rivet forward into position.

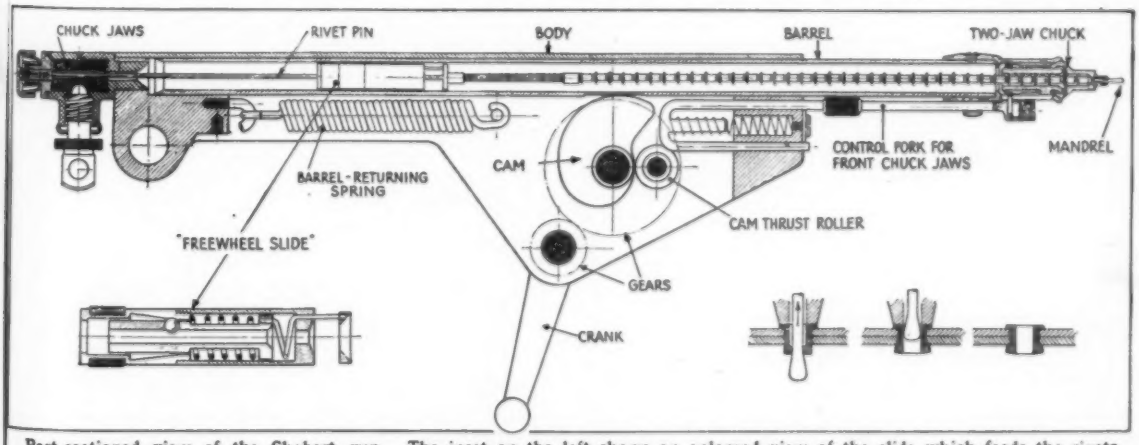
In the sectional view of the rivet gun, the "muzzle" is shown in the position it occupies when the rivet is inserted in the hole previously drilled for it. The mechanism in the "muzzle" of the gun needs a little explanation. It comprises an outer sleeve, locked to the end of the gun barrel, and a two-jaw chuck, split vertically. Inside the chuck is a guide tube for the rivets. During the actual riveting operation, the jaws of this chuck are, of course, kept closed. When the driving handle is rotated in a clockwise direction the cam in the body of the gun is rotated anti-clockwise by means of the gearing. This gearing has a 3 to 1 reduction, so that three complete turns of the handle are required to turn the cam through one revolution.



For extracting an empty rivet pin and inserting a loaded pin, the front jaws of the Chobert rivet gun are held open by a catch on the chuck control rod.

As the crank is turned the cam causes the barrel to move forward, the rivet being headed as the first turn is completed. Further turning of the handle results in the two-jaw chuck being pushed forward out of its restraining sleeve, and the two jaws open under the action of a "figure of eight" spring, thereby permitting the next rivet to slide forward into position. On completing the third turn of the crank the cam reaches and passes the position of maximum lift, and the strong coil spring returns the barrel to the "in" position, ready for heading the next rivet. At the save time the jaws of the chuck close and withdraw into their sleeve.

The manner in which the rivets are fed along the magazine pin is very ingenious. A tubular slide inside the barrel has a passage through its centre for the pin. The slide consists of an outer and an inner member and incorporates a form of free-wheel arrangement, not unlike that used on bicycles. Movement in one direction frees the ball, while movement in the opposite direction wedges it between two converging surfaces. As rivets are used up at the forward end of the pin the column of rivets is moved forward on the pin by this free-wheel slide, and kept together under constant



Part-sectioned view of the Chobert gun. The inset on the left shows an enlarged view of the slide which feeds the rivets towards the mandrel, and on the right are details of the actual riveting action.

pressure by a small spring. When the pin is full of rivets, the slide is, of course, near the back of the barrel. As rivets are used up, the slide travels down the barrel, one rivet length at a time. It is all rather like the old-fashioned toy, "the monkey up the stick."

Speed of operation is, of course, a matter of experience, but after very short practice, even a young lad can, on a straightforward job where the surfaces to be riveted are in a vertical position, soon attain a speed of some 1,200 rivets per hour. To prevent scoring of the mandrel head of the rivet pin it is necessary to oil this frequently, but apart from this there is little the operator need worry about.

To reload the gun with a new pin, already threaded with rivets, the flat-headed screw at the back of the barrel is unscrewed a few turns. This releases the jaws which hold the tail of the rivet pin. The crank handle is then turned until the lower limb of the fork which controls the front chuck comes out of the housing far enough to slide the flat steel stop into the nick of the fork. This holds the front jaws open, and the pin, with the "free-wheel slide," can be pulled out of the muzzle until the washer of the slide comes up against the shoulder of the jaw housing. The pressure on this washer releases the "ball free-wheel" pressure, the pin can be drawn out, and a new one inserted.

Rivets of various diameters and lengths are available in different materials. Different size rivets need different size chucks for the "muzzle" end of the gun. These are all supplied with the gun.

For wing and fuselage construction, the Chobert rivets are used in the form described. Where watertightness is wanted, such as for riveting the plating of a flying boat hull or seaplane float, this can be obtained by driving small metal pins into the holes in the centre of the tubular rivets. By using a special hammer with a piano wire "springy" handle, the pins are driven right home without bruising the rivet head. Flush-riveting is, of course, possible with the Chobert as with any other process, the rivets being merely made with countersunk heads instead of round heads.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers, not necessarily for publication, must in all cases, accompany letters intended for publication in these columns.

THE BOOKING ANOMALY

From Lord Townshend of Raynham.

THE announcement in your issue last week of the proposed amalgamation between British Continental Airways and British Airways is, as you so rightly point out, likely to be the most important development in air transport since the formation of Imperial Airways.

"*L'union fait la force*" is a tag probably better applied to air transport than to most commercial undertakings, and it can be safely said that, henceforth, a single policy will direct the operation of both inland and Continental services of these companies. The Government has only one instead of two companies to consider for the payment of subsidies, and one group capable of placing large orders with airframe and engine constructors should be advantageous to the British aeronautical industry. If the example set in other countries, notably France and Italy, can be taken as an indication of what may happen as the result of this merger, then it is certain that a more efficient organisation, a greater degree of collaboration with foreign air line companies, an acceleration of services, and a greater attention to the comfort and security of passengers, as well as a reduction in the cost of operation, should result.

But all these benefits are likely to be nullified and lost through lack of co-operation by the railway companies, who seem determined to foster foreign competition to the detriment of British enterprise. Your leading article and Richard Carveth's article do more than just ventilate a grievance of the travelling public.

Civil aviation is still in its infancy, we are told, and it is perhaps unimportant that a relatively small number of people should be inconvenienced by the railway companies. But it must not be forgotten that the embargo placed on the airline companies is also a real hindrance to the design and manufacture of British commercial aircraft in favour of foreign enterprise.

The aircraft operating companies would immediately lay themselves open to criticism if they decided to buy, say, American machines, but when the railway companies are allowed quite freely to divert British money to the pockets of French, German, Belgian, and Dutch undertakings, it is high time the Government stepped in to put a stop to such irregular practice.

TOWNSHEND OF RAYNHAM.

London, N.W.

TAPERED-WING STALLING

I HAVE read with great interest Mr. W. E. Gray's articles on tapered wings and stalling contained in the July 16 and 23 issues of *Flight*. It would appear, however, that sweep-back or sweep forward of the leading-edge must have some influence on the airflow at the trailing-edge, and it would therefore seem that more valuable results might be obtainable if changes of taper could be confined to sweeping of each of the edges in turn for first experiments and extended later to combinations of sweep.

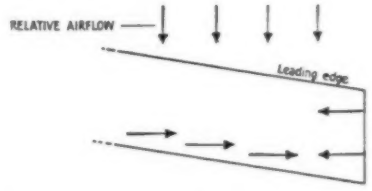
Generally speaking, lateral flow of air on the top surface of a wing must be accompanied by lateral flow over the lower surface in the opposite direction. The effects of lateral lower surface flow are likely to be felt on lift values, but may be of little consequence to stalling. The following remarks are made in the hope that they may be of some assistance in understanding the phenomena connected with tapered wings.

It may be well to consider first the rectangular wing with the pressure differences above and below which give rise to the vortex system, having its core at the wing tip. The vortex flow beyond the tip is upwards, whilst over the wing is the compensating downward flow which is responsible for what is called induced drag, and being most pronounced at the tip results in a smaller effective incidence and consequent late stalling.

Tests have shown, as might be expected, that a moderate amount of taper causes a reduction in the so-called end losses, but if the taper is very pronounced the improvement is lost. The explanation would appear to be as follows: Any pronounced forward or backward sloping of the leading or trailing edge must set up lateral flow due to the lateral pressure gradients, and this lateral flow must cause decreases in the pressure intensities (positive or negative) and hence loss of lift, the effect increasing with the degree of sweep.

The greater lateral pressure gradient due to sweep of the leading edge would at first appear to influence lift to a greater extent than a similar degree of trailing edge sweep, and probably would at normal angles of incidence, but any small loss of negative pressure over the rear part of a wing is of vital importance near the stalling attitude.

From this point we may go on to consider the relation between taper and the position of initial stalling along the span. In general it would seem that where the taper is obtained by sweep-back of the leading edge, or sweep-forward of the trailing edge, the vortex effect would be accentuated and accompanied by late tip stalling, and vice versa. Thus a sweep-back trailing edge would cause an outward flow of air which would be acting contrary to the vortex flow and should result in early tip stalling. There would in fact be a meeting of two opposed air streams (see sketch) causing an upward flow, which in itself would be sufficient to cause an early break-away near the wing-tip.

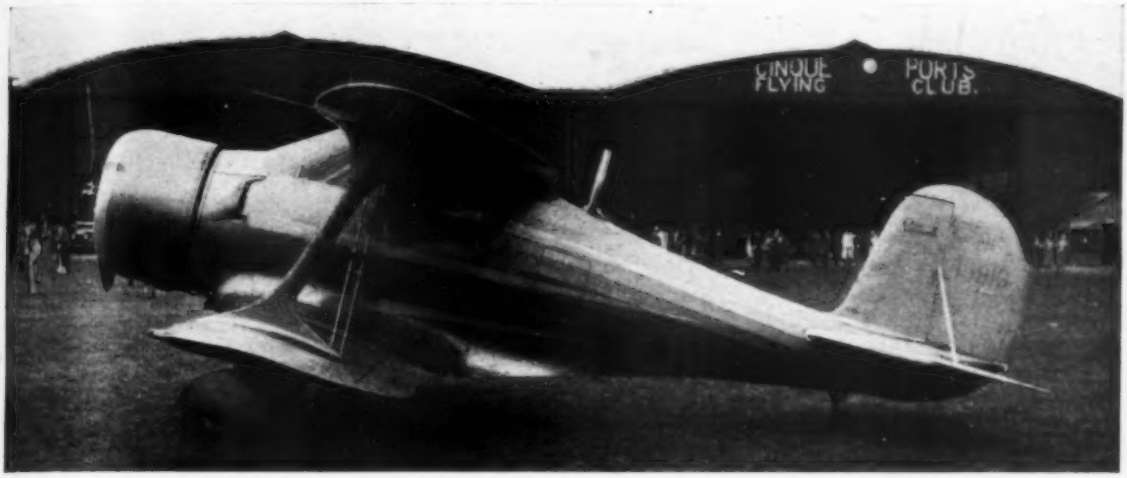


This also would seem to explain the early stalling of the down-wind tip of a yawed wing, for on the up-wind side the flow round the wing-tip and down on to the top surface decreases the effective incidence there.

R.A.F., Henlow, Beds. C. H. LATIMER-NEEDHAM.

COMMERCIAL AVIATION

— AIRLINES — AIRPORTS —



HIGH-SPEED LUXURY : The latest Beechcraft photographed last Saturday at Lympne whither it was brought by Mr. James Haislip, the European representative. This machine, the C.17.R, is powered with a 420 h.p. Wright Whirlwind (which gives it a maximum speed of 210 m.p.h. at 12,000 feet) and was brought over, appropriately enough, by airship from the States. Surrey Flying Services are the Beech agents for the United Kingdom and Ireland. (*Flight* photograph.)

THE WEEK AT CROYDON

Full Loads : Olympic Specials : A Fast Visitor : International Friendship : Débris : Apologia

CONSIDERING the foul weather it was amazing what a rush there was to all parts by air during the holiday, though I noticed that the B.B.C. positively gloated over the numbers of poor boat and train travellers, and did not mention the airports on Saturday evening. Air France seemed especially busy ; eleven services each way on Friday and thirteen on Saturday. K.L.M. was duplicating services, especially early morning departures, and at one time I saw three big four-motor machines, the G.38 *Gen. Field Marshal von Hindenburg*, a Heracles, and a Fokker F.36 on the tarmac at the same time.

Imperial Airways and Swissair are experiencing really remarkable traffic on the Zurich line, and, what is more, it is steady week after week, and is not the usual one-way rush, which means many poorly filled machines flying in the other direction. All last week these services were full, and this week they are fully booked. People are actually putting off their holidays until they can obtain seats.

Herr Mittelholzer came in one day last week with a special Swissair Douglas to take Lord Beaverbrook and his party to the Olympic Games. By the way, Lord Beaverbrook's own D.H. Dragonfly is now at Croydon, and Mr. "Biffy" Newman stands by to fly it when required. Capt. "Bill" Ledlie, of Personal Flying Services, has been tremendously busy, he tells me. The three Goodwood days he was ceaselessly occupied, and, incidentally, through his good offices a sportsman was able to see the first four races there one day and then fly to Southampton to catch the *Normandie*. The journey took eighteen minutes instead of two hours by road, and if the latter mode of travel had been used only the first race could have been witnessed. One day last week he took a party of jovial butchers to Yarmouth, where, presumably as a holiday from steaks and loin chops, they devoured winkles on the beach, inviting their pilot to join them, for "Bill," amongst other accomplishments, wields a pretty pin. Next evening, with another party of clients, "Bill" (or should one say William this time?) was dining in tails at the Ritz.

There have been several special machines to Berlin for the Olympic Games. There are no rooms to be had in hotels in the German capital, so it is said. One of Capt. Ledlie's clients solved the problem in the sensible way. Having seen the games, he used the aeroplane as one might employ a taxi to get out of a crowded city. Capt. Ledlie flew his client to a country hotel about a hundred miles from Berlin.

The twin-engined Heinkel visited Croydon for the first time during the past week. It then flew the Maharaja of Baroda to Berlin to see the Olympic Games, and the big G.38 left Croydon with a load of thirty English public school boys, the trip being organised, it is understood, by the King George V Jubilee Trust Fund. On Sunday K.L.M. had, as passengers, several members of the International Friendship League, who were met by the British secretary and members, and then flew on to Heston.

Another kind of international friendship league set off from Croydon to Amsterdam by air about the same time, when Major Anson's cricket team started for their annual tour of Holland. There is nothing like cricket to spread international amity, what with body-line bowling, the leg-break (mainly designed to break arms), and all that.

British Continental Airways stopped the Scandinavian

service from Croydon last week, leaving this route to their new partners, British Airways, who have subsidy and mail contracts on that line.

The Croydon public enclosure was a mass of newspapers and *débris* after Bank Holiday. The salubrious effect of turning the tails of big four-motor aircraft on to any bit of ground that needs purging might commend itself to the authorities, especially such types as the Diesel-motored Junkers. Aeroplanes may not have such a fun-provoking wash as the *Queen Mary*, but the equivalent gale is capable of removing litter—including dogs, small boys, and persons carrying open umbrellas, in quite a humorous manner.

It appears that I owe the control tower an apology, not for what I said, but for what I left to the imagination of the supposedly intelligent reader when remarking on Capt. Rogers' adventure a couple of weeks ago when he descried what he thought was some sort of wreck in the Channel. The point was that when the Imperial machine changed over to shipping wavelength, nobody took any notice, which, I remarked, looked like slack watch-keeping afloat or ashore. Naturally, I was not referring to the control tower but to ships and nautical short stations; but as, in the prevailing weather, nobody knows if the Croydon tower is afloat or ashore, possibly I should have been more explicit.

What the control tower staff did on receiving the air liner's message was to telephone North Foreland and initiate a broadcast to shipping; have coastguards warned and the Eastbourne lifeboat launched; and ascertain that ships were in the vicinity, so that it was quickly discovered that the flotsam was but a drifting survey buoy. That is what I call a handsome apology! A. VIATOR.

Four Out of Ten

OF the ten pilots who sat for the First Class Navigators' examination four succeeded in outwitting the examiners. These were: W. M. Cumming, S. M. Ferguson, G. J. Powell, and N. Richardson. The next examination will be held in March, 1937.

The Channel Islands Disaster

AT the time of going to press all hope had been abandoned for the safety of the ten occupants of the Saro Cloud which was lost while making the normal trip between Guernsey and Jersey. The pilot was Mr. W. Holmshaw. This is Jersey Airways' first serious accident in more than two years of winter and summer operation.

Faster to Biarritz

AIR FRANCE announce a new service which takes passengers from London to Biarritz in 5hr. 20min. The service, which started on August 1, will be run every day of the week except Sunday. Passengers leave Croydon at 8.45 a.m., arriving at Biarritz at 2.5 p.m. Stops of half an hour are made at Paris and Bordeaux, so that the 800 miles from London to Biarritz is covered in 4hr. 20min. of actual flight.

The return journey starts from Biarritz at 12.15 p.m. arriving back at Croydon at 6.30 p.m., with similar stops at Bordeaux and Paris. The fare is £10 9s. single, and the return ticket, available for two months, is £18. As compared with boat-train travelling, the time saved is 16hr. 20min. with one-third more on the fare.

Study in Europe

ON July 19 the Danish commission mentioned in "The Week at Croydon" in *Flight* of July 23, returned to Copenhagen. Headed by the Danish Minister of Transport, Mr. Fisker, the delegates visited many of the better-known European airports. They travelled in a Fokker F.12, which was placed at their disposal by D.D.L., and flew to Tempelhof, the new airport at Frankfurt, Le Bourget, Croydon, Gatwick, Schiphol (Amsterdam), Twente, Groningen and Hamburg. Everything points to the possibility that this tour may be of considerable importance, heralding extensions and developments in Danish air transport.

Newfoundland Terminus

A CORRESPONDENT in Newfoundland tells us that the Cabbis Camp airport will cover an area of 242 acres and will have four runways, E.—W., N.—S., N.W.—S.E. and N.E.—S.W. The latter will be the main runway and is to be equipped for blind approaches; its dimensions are 1,600yd. ×400yd. The remaining runways will be 1,500yd. × 200yd., and each will be disposed in such a way that no aeroplane will have to take off more than 22 deg. out of the wind. The first part of each runway will be of concrete, while the remainder will be of tar-macadam. The surface is designed to withstand a landing shock of 5 tons per sq. ft.

The aerodrome site is approximately 500ft. above sea level and will require very little levelling. At present it is covered with young trees. The land slopes away from the site, thus simplifying drainage. The aerodrome, now known as Newfoundland Airport, is located south of the railway, forty-two miles east of Botwood (the proposed base for flying boats), and north of Gander Lake.

Clearing operations have now begun, and some 200 men with machinery are on the job. As work will have to be suspended during the winter months the airport is not expected to be finished much before the end of next summer.

Gatwick on the Air

THE short range D/F station at Gatwick airport is now in working order. The call signs are, for W/T, GJL, and for R/T, "Gatwick," and the frequency is 363 kc/s (826m.).

At Last

ARRANGEMENTS have now been made whereby the Hayes gasholder will be illuminated in the usual way. There will be eleven lamps on the upper perimeter and one on the central ventilator. The installation should be ready before the winter season. Good work by the G.A.P.A.N.

Delay at Portsmouth

THE Portsmouth City Council is to reopen negotiations with the Air Ministry with the idea of obtaining a larger capital grant for the Langstone Harbour project. The council has decided that an addition of 3d. on the local rates is too big a price to pay for the glory of a local Empire flying-boat base.

Successful Pioneering

FOLLOWING the news that West Australian Airways had been purchased by the Adelaide Airways section of the big development company, Australian National Airways—details of which were published in *Flight* of July 16 and 23—copies of the reports which were read at the final shareholders' meeting of the W.A.A. have been sent to us by Major Norman Brearley. He adds that it is his intention to act in any suitable capacity for those requiring his services in the aircraft industry and also to travel abroad occasionally in order to keep in touch with general developments.

When so many people have denied profit-making possibilities of largely unsubsidised operating companies, it is more than interesting to remember that West Australian Airways have, during fifteen years, returned an average of 30 per cent. to their shareholders. Even after an increase of capital in 1928, and after the depression which unfortunately followed this increase, the shareholders received as much as 12½ per cent. Both Major Brearley and Col. C. H. Lamb, the chairman, paid tribute to the help and encouragement given by the late Col. Brinsmead when Controller of Civil Aviation in Australia, and to the devotion of the staff of the company.

Misr Airwork Extension

H. E. TALAAT PASHA HARB, the managing director of the Banque Misr and a director of Misr-Airwork, has been spending a few days in England discussing his many Anglo-Egyptian interests. He states that the Misr-Airwork extension, connecting Cairo, Cyprus, Damascus and Baghdad, has been approved by the Egyptian Government and will be opening in August. This extension was surveyed last spring in a Rapide aircraft by Kamal Eloui Bey, the managing director of Misr-Airwork, and by Mr. Alan Muntz, a director of that company acting also as technical advisor on behalf of Airwork. Its practical operation has now been made possible by the Egyptian Government's undertaking to place it on an adequate subsidy basis.

Talaat Pasha Harb and his colleagues in business constantly find it necessary to charter machines to visit business interests in the Hedjaz, Iraq, and elsewhere. In order that regular airline equipment need not be diverted to this purpose, Misr-Airwork is considering the purchase of a medium-sized aircraft—possibly a D.H. Dragonfly—for private charter only.

THE NORTH ATLANTIC AIR MAIL

An Important Public Announcement : Experimental Flights to Start Shortly : Details of Co-operation Between Five Governments

NORTH ATLANTIC air service plans are moving swiftly towards consummation. In the House of Commons last week Sir Philip Sassoon made a not altogether unexpected announcement which disclosed details regarding the subsidy scheme in which Britain, Canada, Newfoundland, the Irish Free State, and the United States are co-operating.

Sir Philip's statement was in answer to a question by Capt. J. H. F. McEwen (Cons., Berwick and Haddington). He said that, as had already been announced, discussions took place in Ottawa in November last between representatives of the United Kingdom, Canada, the Irish Free State and Newfoundland regarding the establishment of an air service across the North Atlantic. Arrangements were finally agreed upon subject to the approval of the Governments concerned, which had now been given, to enable survey flights to be undertaken and an experimental air mail to be established as soon as possible, to be followed eventually by a mail and passenger service on a minimum schedule of two flights a week in each direction. Discussions also took place immediately after the conference in Ottawa, with representatives of the United States Government in Washington with a view to assuring the fullest measure of understanding and co-operation with the United States in the development of Transatlantic flying. As a result understandings were reached based upon the principle of full reciprocity which it was hoped would bring about, as soon as practicable, the establishment of a Transatlantic air service connecting the countries concerned.

Co-operative Effort

The main details of the arrangements agreed between the respective Governments were as follows:—

(1) A joint operating company which would be responsible for carrying on the services will be incorporated at the instance of three companies, of which one will be nominated for that purpose by the Government of the United Kingdom, one by the Irish Free State Government and one by the Canadian Government. The company nominated by the United Kingdom Government would be Imperial Airways, Limited. The board of directors of the joint company would be nine in number, of whom three, including the chairman and managing director, would be nominated by the United Kingdom company, three by the Canadian company and three by the Irish Free State company. The capital of the joint company would be subscribed and held as to 51 per cent. by the United Kingdom company, 24½ per cent. by the Canadian company and 24½ per cent. by the Irish Free State company.

(2) In return for landing facilities to be granted to the joint company by the United States Government, Pan American Airways would be granted landing facilities by the Governments of the United Kingdom, Canada, the Irish Free State and Newfoundland; and that company would participate on a basis of reciprocity with the joint company in the operation of the services

(3) In the operation of the services all practical preference would be given to the direct route from this country *via* the Irish Free State, Newfoundland and Canada, but it might be necessary during an initial period to operate the services *via* Bermuda during the winter months.

(4) Experimental long-distance flights and other necessary investigations would be carried out in the near future. The incorporation of the joint company would involve some delay and it had been arranged that experimental flights and investigations should be conducted by Imperial Airways. The results of the experimental flights and investigations would be placed at the disposal of the joint company when it is established. It was understood that Pan American Airways would also be conducting experimental flights.

(5) The control of commercial technical and operating matters would be secured to Imperial Airways through its stockholding and through the medium of the articles of association of the joint company, subject to the superior jurisdiction of the board of directors in questions of major policy.

(6) During the experimental stage flying operations would be financed by the Government of the United Kingdom. When the joint company assumed responsibility for flying operations it would receive an annual subsidy from the several Governments on an agreed basis.

Of the total annual subsidy required, Canada would contribute 20 per cent. subject to a maximum of £75,000, the Irish Free State 5 per cent. subject to a maximum of £12,000, and Newfoundland a sum to be agreed between that Government and the United Kingdom Government; the remainder would be made up by the United Kingdom Government. In consideration of their contribution, the Irish Free State Government would be entitled to participate in the Empire Air Mail Scheme, if and when they so desired, without payment of further subsidy but only of the postal payment.

(7) Each of the four Governments concerned had undertaken to arrange for the provision of the necessary airport, radio and meteorological facilities for the Transatlantic service. In connection with the general transfer of meteorological services to a new organisation being developed in the Irish Free State the United Kingdom Government would make an annual contribution of £6,000 to the Irish Free State Government on the basis of services rendered.

(8) Each of the four Governments concerned had also undertaken to grant the necessary landing and transit rights within its own territory to the joint company and to Pan American Airways. It is contemplated that unless otherwise determined by the consent of the four Governments such rights would be exclusive in respect of Transatlantic air services for a period of fifteen years; thereafter the question of exclusivity and the question of granting further financial assistance to the joint company would be reviewed.

(9) An inter-governmental committee on Transatlantic air services would be established, consisting of four members appointed respectively by the Governments of the United Kingdom, Canada, the Irish Free State and Newfoundland, to which would be referred for approval decisions of proposals of the joint company relating to Transatlantic air services which may affect national policy or the relations of the Governments concerned *inter se* or with other Governments. All decisions of the inter-governmental committee would be reached by unanimous vote

[*Editorial comment on these plans appears on p. 149.*]

Ireland and the Atlantic

FOLLOWING the statement in the Dail, which was similar to that made in the House of Commons, on the Transatlantic air service, Mr. T. Derrig, acting Minister for Industry and Commerce, said that the Free State airport, with adequate radio and meteorological equipment, will provide all necessary facilities for flying boats and land machines, and will be constructed, owned and controlled by the Free State Government.

The Minister then stated that it might be useful if he gave the House a general picture of their financial commitments in connection with the scheme. "The total capital outlay on the airport and on wireless and meteorological services in connection with the Transatlantic air service," he said, "is estimated at approximately £520,000; this includes £20,000 for accommodation of a residential character for staff, for which it is intended to charge appropriate rents. The annual charges for operation, maintenance, and depreciation are estimated at £50,000; of this £40,000 is attributable to the airport proper and £10,000 to radio and meteorological services.

"It is, I think, generally known that the rather limited meteorological service at present in existence in the Free State has hitherto been maintained by the British Government. Arrangements are being made for the transfer of this service to the control of the Free State Government, and it is our intention to develop it into a first-class meteorological service, and I may say, incidentally, at this point, that the British Government has agreed to contribute £6,000 per annum towards the cost on the basis of services rendered.

"There are two further points which may interest the House. The first is that a suitable proportion of the joint operating company's aircraft will be registered in the Free State. The second is that the Free State will be the first European port of call for all eastbound aircraft on Transatlantic services on the direct route, and the last European port of call for westbound aircraft on that route. The necessary arrangements will be made to enable traffic and passengers to join the aircraft at the Soarstat airport."

Private Flying

Topics of the Day

TO anyone who is interested or amused by his fellow-beings and who has the nervous make-up which will allow him to be very nearly killed before opening the throttle at the last second, instruction must be the most entertaining of jobs. To anyone else it must be a crashing and uncomfortable bore.

Even with my small experience of people and aeroplanes I have learnt to know almost exactly how different people will react in different flying circumstances or when piloting strange machines. As an instance, I am over-tense when the weather closes in on a cross-country, and sometimes perform badly, through sheer over-anxiety to do well, when accompanied by an expert in a strange type. Lack of confidence perhaps. On the half-dozen occasions when I have been let loose by myself on some queer device the results have been rather more satisfactory.

Guide to Psychology

AMONG the experts there is the pilot who is good and knows he is good; he usually shoots everybody up, and is doing slow rolls at five hundred feet within five minutes. There is the pilot who is good, knows it, but does not want everyone to think he knows it; he goes away from the aerodrome to do his stuff. There is the pilot with long experience who is so good that he knows that *every* machine, if badly treated, will bite the hand that feeds it; he climbs to 2,000ft., and stays there.

Among the non-experts there is the pilot (he usually talks in a loud voice and is incredibly certain of himself) who only thinks he is good; he performs poor and somewhat dangerous aerobatics of a mild but spectacular variety, comes in too fast, swish-tails, and lands on one wheel. He wouldn't believe it if someone told him that his performance was rotten—and no one has the courage to tell him, anyway. There is (one step down) the pilot who talks a lot, but who has a mysterious prior engagement when a machine is offered for his consumption. There is (two steps up) the amateur who knows his limitations; he takes off gingerly, climbs in a straight line, performs nothing more aerobatic than a steep turn, comes down at the recommended velocity, pump-handles a little, and winds his performance up with a perfect three-pointer.

One can continue almost indefinitely. I have flown with transport pilots who rigorously check and recheck, who have the courage to turn back if the weather is thick and there is no radio at the terminal aerodrome. I have flown with those who are less careful, but who have had such an extended experience in all kinds of weather that one cannot fail to feel confident. I have flown (once) with a pilot who said, "That will be all right, you'll find," and yet steamed up his windows with nerves, and spoke sharply to his radio operator when things went from bad to worse. In another two generations the human race, if it isn't wiped out by its own stupidity, may produce the perfect pilot in quantity.

Expert Supervision

IT has often occurred to me that aeroplanes may never become really good and really safe so long as the super-pilot has so much say in the business. It would be absurd to suggest that the experts actually prevent the easily flown machine from being developed, but they have certainly permitted a number of aerodynamic monstrosities to be foisted on the amateur at one time or another.

The super-expert is often simply incapable of seeing that there are difficulties in the handling of certain machines, though they are not slow to explain that machine X is a holy terror when the unfortunate amateur wishes to go off in it after it has been manufactured. Not long ago I flew, without previous advice or information and certainly without particular difficulty, an aeroplane about which I have since heard the most hair-raising advice being proffered. There is far too much of what the Americans call boloney in this flying business.

If anybody asks me by what right I dare to say what I think about a light aeroplane, my reply is always that I am typical of the prospective owner, and, therefore, that what I think in my own comparative inexperience is at least as important as anything thought by anyone who is clever enough, for instance, to get a Gee Bee safely off the ground and back again—and experienced enough to pass it over as a pleasant little aeroplane. If a reasonably competent amateur finds an amateur's type difficult, then the machine is not fit to be produced and sold.

One or Two?

SOME modern machines, and particularly those faster examples from the States, demand a very special, though not difficult, technique when they are being brought into a smallish aerodrome. They cannot be adequately or safely sideslipped, and it is customary to motor them in. While in the air—cruising, perhaps, at 10,000ft.—the engine is working at about 50 per cent. full power, and their sponsors claim that, with so much reserve, a single engine is at least as reliable as two engines working at, perhaps, 75 or 80 per cent. full power.

True though it is in the matter of mechanical reliability, it is a fact that the vast majority of engine failures are caused by "installation defects," and not by breakages. A fuel-feed failure is as likely (or unlikely) when flying at 50 per cent. full power as it is on full throttle.

Certain it seems that, for medium-sized machines, we in this country with our small aerodromes and still smaller fields, are twin-engine minded. It can always be argued that to have two engines is to double the possibilities of failure, and to this there is one excellent reply. The failures are not likely to occur at the same time, and the second engine, even if it runs only for another quarter of an hour, gives the pilot the additional time which is so important.

INDICATOR.

FROM the CLUBS

Events and Activity at the Clubs and Schools

MIDLAND

THE flying times for the week ending July 31 were: dual 28 hr. 35 min., and solo 29 hr. 25 min. Mr. Sandland has joined the club as a flying member.

DONCASTER

Club machines flew 24 hr. 5 min. during the week ending July 31, making a total of 110 hr. 15 min. for month of July. Miss S. Ram is a new flying member.

WITNEY AND OXFORD

The total of 57 hr. was flown at Witney during the month of July and Mr. Walter Westoby obtained his "B" licence. New members were Miss Olive Reeves and Messrs. C. A. W. Samuda, P. H. T. Rogers and F. A. Montague.

CAMBRIDGE

Flying times at Marshall's Flying School, The Cambridge Aero Club, and the University Aero Club for the week ending on August 2 totalled 80 hr. The Hon. J. R. Scarlett, Miss Harding, and Messrs. Warrington, Fell, Smedley, and Buchanan completed their first solos. "A" licences were obtained by the Hon. J. R. Scarlett and Miss Hill. Mr. Salisbury joined the school.

NORTH BRITISH

The past week's perfect weather (in opposition to that experienced in England) has kept the flying hours, both dual and solo, well above the average. New flying members include Dr. Agnes Thomson. Visitors to the aerodrome included a Surrey Flying Services Dragon, which arrived direct from Croydon to pick up an ambulance case. The ground staff has now been augmented by a fifth G.E. at Dyce.

ROYAL AIR FORCE

The continued atrocious weather offers little or no encouragement for pleasure flying, but, nevertheless, members are doing their utmost to utilise the few fine intervals. Last week F/O. L. Swan took one of the Gipsy I Moths abroad, where he appears to have had an enjoyable week in the Frankfurt neighbourhood. The following members have recently joined the club: Air Marshal Sir J. Maitland Salmond; Air Marshall Sir Charles Burnett; F/O. E. J. Earnshaw; P/O. N. B. R. Bromley, and F/O. L. Winter.

NORFOLK AND NORWICH

During last month more than 200 hr. were flown by the club—fifty-seven of which were flown in a single week. This is a record for the club for this year. Mr. G. A. Wells made his first solo early last week. Mr. Carter, who first joined the staff as an apprentice no less than seven years ago, has successfully passed his ground engineers' examinations and the club has now the services of two fully qualified G.E.'s. Yesterday the Third Public Schools Aviation Camp was opened, in charge of Dr. Harold Birchall of Taunton School.

HANWORTH

At the London Air Park Flying Club Mr. W. Moody (N.L.A.) and Major Duncan made their first solos last week and Mr. Lewis passed his "A" licence tests. Capt. Lloyd has completed a course of blind flying and instruction is now being taken by Mr. Henderson. Two Club machines—a Leopard Moth and a Monospar—have been used to convey passengers to the Olympic games. Mr. Llewellyn is, of course, very busy preparing for the London-Johannesburg race, in which he is flying a Percival Vega Gull. The flying total last week was 82 hr. 25 min.

BORDER

Although the flying conditions at Carlisle have not been good enough for much early solo, Mr. Robinson has completed his "A" licence tests. The previous week-end was mainly occupied with the search for the unfortunate airmen from Edinburgh who lost their lives on Broad Law, near St. Mary's Loch. All the serviceable club aircraft took part. This is the second fatal accident this year to aircraft flying to Carlisle, and the aerodrome authorities are preparing an article on the most suitable routes to and from Carlisle, together with advice regarding flying in these hills.

CINQUE PORTS

On Sunday last, Miss Jeanne de Casalis held her annual variety show at Ashford in aid of various charities. Her guests—famous actresses and actors—assembled at her cottage near Charing in the morning and several club members flew over and landed in a nearby field. After lunch (sheep roasted over an open fire) most of the guests went up for joy-rides, the proceeds of which went to charity. The three instructors did some formation flying and individual aerobatics. New members last week were Messrs. Hilditch and Taylor. Mr. T. Hackney has passed all his "A" licence tests.

REDHILL

The hours at Redhill for the week ending July 31 amounted to a little over ninety-seven. First solos were made by Messrs. Stevens, Broad, McLeod, Glabbeek and Hill.

C. A. S. C.

On Sunday members flew 5 hr. 30 min. at Fen Ditton despite very unfavourable weather conditions, and four members were on duty at Heston Airport. Mr. W. G. Smith has joined as a probationary member.

PORTSMOUTH

The flying time put in by the Portsmouth Aero Club for the week ended July 31 totalled 33 hr. 55 min., making a total for the month of 104 hr. Bad weather interfered with the club flying to a large extent during July. New members were Mrs. M. Conway and Mr. H. J. Barnes.

SOUTH COAST

Continued bad weather at Shoreham has held up flying, the only good day being last Sunday when the club flew fifteen hours. On this day, also, all the machines attacked Brooklands for a Dawn Patrol and Yapton for a Cocktail Patrol, Miss Spiller succeeding in obtaining a free breakfast at Brooklands. New members include Messrs. Trost, Lambert, Golden, and Lunden.

NORTHAMPTONSHIRE

The week has been a very active one at Sywell. A first solo was carried out by Mr. C. I. Clarke and four new members joined. Many members turned up on Sunday, July 26, to welcome those foreign visitors flying in the Week-end Aérien who called in at Sywell prior to proceeding to Ratcliffe for lunch. On Wednesday, July 29, Mr. H. Deterding and Mr. G. Linnell, with friends, left Sywell, by air, for Berlin, where they intend to witness the Olympic Games.

NOTTINGHAM

The flying time at Tollerton for the week ending July 30 totalled 46 hr. Mr. G. Booth made a successful first solo, and Mr. and Mrs. Marchant and Mr. P. P. Bradley were enrolled as flying members. On Sunday, the 26th, the annual competition for the *Nottingham Journal* Trophy was held, the winner being Mr. Keith Davis, of the Nottingham Flying Club, and the runner-up Mr. R. Winn, of the Leicester Club. The competition was in the form of a navigational contest, and there were twelve competitors in all.

BROOKLANDS

Bad weather at the beginning of last week curtailed flying at Brooklands, although on the Sunday before last 36 hr. were put in. A first solo was made by Mr. E. Urlwin-Smith after only three hours' instruction and "A" licences were obtained by Messrs. E. G. Russell-Roberts and B. J. Rasmussen. New members are Messrs. H. J. Hague and M. Babitcheff. The Club's Tiger Moth has been used by Mr. Gray (whose article on the stalling of tapered wings recently appeared in *Flight*) for further photographic experiments with wool-tufts.

YORKSHIRE

Club machines flew 81 hr. 25 min. at Yeadon last week. During July 275 hours were flown, showing a substantial increase on the total for July, 1935, which was 230 hours. New members are Mr. J. Gawthorp (Overseas Member) and Miss N. Robinson (Flying Member). New aviation group members are Messrs. J. F. Heaton and H. Heaton. Messrs. J. D. A. Kenworthy and R. V. Palmer have passed their "A" licence tests and Messrs. F. G. S. Ferrand, G. F. D. Walker, H. Audsley (Young Pilots Fund pupil), and G. Vivian (Aviation Group Member) have made first solos.

HERTS AND ESSEX

Owing to adverse weather conditions during the fortnight ending July 31, flying hours decreased considerably. The time during the period was 168 hr. 27 min., making a total for the month of 426 hr. 15 min. First solos were made by Messrs. Fletcher and Williams, while Messrs. Hamilton and Fletcher completed the "A" tests.

There was a large entry in the annual cross-country competition for the Yager Challenge Cup, the winner being W. A. Tyler; 2nd, V. A. Ercolani; and 3rd, H. A. Ellis. Among the numerous visitors during the latter week were Erbprince zu Solms from Germany, who arrived on the 26th in an Adler and stayed for the night, departing in the early hours for Berlin.

The club is commencing flying operations at Gravesend Airport on Tuesday, August 11. Mr. Roger Frogley will be in charge, flying and membership charges will be the same as at Broxbourne, and all facilities offered at both clubs will be available for one subscription. The August competition will be a cross-country event for the Wrighton Challenge Cup, and will take place next Sunday.

Privtae Flying

CROYDON GLIDING

On July 19 the newly formed Croydon Gliding Club started activities with a rebuilt R.F.D. primary; a secondary type is expected in the near future. The club operates on a site only eight miles from Croydon and on the first day twenty-three flights were made by six members. The secretary is Mr. A. Lindsley, 20, High View Avenue, Wallington, Surrey.

MADRAS

The chief event of interest during June was the arrival of the B.A. Swallow to make No. 4 of the Madras Flying Club's fleet. This docile machine was in operation before the close of the month and was well patronised. A new member, in the person of Mr. Bhuyan from Orissa, was welcomed, and, after an absence of three years, an old member, Mr. J. D. Italia, has come to renew his "A" licence. As for cross-country flying, Mr. D. W. Law and a friend returned from Bangalore on one of the Gipsies on the first of the month; Messrs. J. Mathai and Sundararajan (and Master Parthasarathy) continued their flight in the Puss on the second, proceeding from Delhi *via* Cawnpore, Allahabad and Gaya to Calcutta and finally returned to Madras on the 11th via Vizianagram, completing their journey in two final hops of 440 and 450 miles, with four gallons of petrol to spare at the end; on the 24th Messrs. Arya and Sundaram went to Bangalore in the Puss, returning next day; and lastly, on the 29th, the instructor took a charter flight with two passengers to Hyderabad, returning the following day with one.

Early in the month the instructor took advantage of a slack spell to go by train to Coimbatore to approve the site of the aerodrome there and thence he went on to Mandapam, near Adams Bridge, to examine sites for an emergency landing ground on the Ceylon route. The ground engineer, while on leave in Bangalore, took the opportunity of examining sites at Kolar Gold Fields for an emergency landing ground—as well as one for a possible future aerodrome there.

Seventy-nine instructional hours were flown during the month.

A Ramsgate Aviation Camp

BETWEEN August 29 and September 26, the National League of Airman is sponsoring an aviation camp to be held at Ramsgate airport. Full accommodation will be provided at an inclusive figure of £5 5s. a week.

Instructing the Instructor

Guide for Flying Instructors (*Guild of Air Pilots and Air Navigators*. 5s. 6d.)

DURING the past few years a number of books have been published dealing with the art of flying. The majority of these, though written by instructors, have been written for the novice and a very large proportion of the pages have been devoted to extensive explanation of first principles. Here we have a book which, though written for instructors, will also be invaluable to the pupil.

It covers the sequence of instruction, both in the air and on the ground, for landplanes and for the C.30 Autogiro, while there is a section devoted to instrument training methods. This last gives the most complete yet agreeably terse information on the subject; the demonstrations of compass behaviour, for instance, are most valuable. Seaplane training has not been dealt with owing to the facts that floatplanes and boats have very different characteristics and that the difference in technique starts and finishes on the water.

The first part of the guide is devoted to the general conditions of issue of the G.A.P.A.N. instructors' certificates and to reproductions of the forms to be completed in each category.

The foreword, appropriately enough, has been written by Col. Smith Barry, late commandant of the Gosport Flying School and the originator of the present-day system.

No Aberdeen Race

THE London-Aberdeen Race, which was arranged for August 15, has been cancelled, as the aerodrome extensions are not quite completed.

The Navy is at Home

ON Sunday, August 16, the Royal Naval Flying Club is giving an "At Home" at Portsmouth airport between 3 and 6 p.m. There will be a programme of flying events, including a "fifty hour limit" landing competition and a bomb-dropping competition, which will be open to members of the R.N. Club, the Royal Engineers' Flying Club, the Portsmouth Aero Club and other affiliated organisations. Applications for tickets should be made to the Secretary of the club, c/o Royal Aeronautical Society, 7, Albemarle Street, London, W.1, before August 12.

Pillars of Fire

MALCOLM and Farquharson, of Heston, have been appointed sole distributors in the British Isles for the Pillar of Fire boundary light, which is manufactured by the Cardiff Foundry and Engineering Co. These lights are used at both Cardiff and Doncaster airports, and give the approaching pilot such a good idea of height and distance that a floodlight, it is claimed, is almost superfluous. M. and F. are prepared to quote, however, for floodlighting equipment!

Southdown Soaring

A WELL-ESTABLISHED sailplane club entered on a new lease of life last Saturday, when the new hangar and clubhouse of the Southdown Gliding Club, at Atlingworth Valley, was formally opened by the Mayor and Mayoress of Brighton. With the facilities now available, it will be possible to accept many new members.

Formed in 1930 as the Southdown Skysailing Club, the Club kept going throughout the slump which killed so many others. Its fleet now consists of a B.A.C.7 dual-control two-seater, which is virtually a Drone minus its engine; a primary trainer; a Dagling and a Prufling (secondaries), and one of the beautiful little Grunau Babies (advanced), with enclosed cockpit.

Mr. R. F. Dagnall is the Club's chairman, and the hon. secretary is Mr. A. York Bramble.

The site is, perhaps, unique, the Clubhouse lying in a sort of miniature Devil's Dyke, the inner slopes of which provide a training ground, while the outer offer a wide choice of soaring facilities according to the quarter of the wind.

A snag is a line of high-tension cables across the top of the valley. Only one enthusiast, however, has tested their potentialities. He was being towed into the air by the club's winch-car, when the towing cable hit the H.T. lines. A neighbouring town was plunged into darkness, the car temporarily had an ignition system undreamed of by Mr. Lucas, and the enthusiast came to earth, miraculously unhurt.

Last Saturday's ceremonies suffered somewhat by reason of the weather, but Mr. Kronfeld, in his Drone, appeared out of a cloud as black as a hat, and later gave demonstrations. He also flew his KR1a high-performance two-seater sailplane, taking as passenger the Mayoress of Brighton, who had never previously flown in any type of aircraft. Mr. E. C. Gordon England, late chairman of the council of the B.G.A., provided a very informative loud-speaker commentary.

On Sunday and Monday various Club competitions were flown.

POUX at SPEED (*Continued from page 157.*)

be primed *via* the exhaust stubs—and weird were the exhaust notes, varying from the staccato clatter of twins to the snarl of a French four-cylinder two-stroke Ava.

On the scratch mark were two 33 h.p. Carden-engined Abbot-Baynes cantilever *Poux*, one in the hands of Claude Oscroft, instructor to the Aero 8 Club, and the other of M. Colli. These two were giving 6 min. 59 secs. to the limit man, Robineau, who had a 17 h.p. Aubier-Dunne twin two-stroke.

The wind was a gusty one of between 20 and 30 m.p.h., but all the take-offs were without incident.

The tale of the race is soon told. Bret, with the 27 h.p. Ava engine, started third, conceding 2 min. 35 sec. to Robineau, and 1 min. 30 sec. to Lane, who had a 25 h.p. Poinsard engine. He caught the latter, who was travelling high, in the first lap, and the former in the second. It looked as though he would have a clear run to the finish, and so it proved, only Appleby, in his original Carden-engined *Poux*, threatening him. Bret won at an average speed of 56.75 m.p.h., with Appleby (59.5 m.p.h.) close on his tail, and Robineau (50 m.p.h.) a good third; all three were in the same half mile or so of sky—a real triumph for the handicappers. Oscroft, travelling genuinely fast, was only a fair fourth at 57.5 m.p.h., but would certainly have been placed had he not wandered from the course early on. He covered one lap at 80 m.p.h. Colli was fifth at 56.25 m.p.h., and Lane last at 43 m.p.h. F/O Clouston was the only retirement, coming in after the first lap dripping from head to foot with hot oil from a faulty lubrication lead to the magneto drive on his Scorpion.

One more thing remains to be quoted—the inscription on the rudder of M. Mignet's H.M.18: "Flying Flea flies in England—I thank the British Air Ministry—H.M."

SMALLER-SCALE AIR EXERCISES

Last Week's Operations in South-Eastern England : Many Raids Intercepted

IT may be assumed that last week's air defence exercises, though organised on a smaller scale than those of last summer, and confined to the Eastern side of London, provided valuable data. Operations began at 10 a.m. on the Monday, and continued intermittently until 3 p.m. on Friday. By day formations of Hinds carried out the raids, while night raids were, as usual, made by a stream of heavy bombers (mostly Heyfords) working individually. The defending aircraft were Furies, Gauntlets and Bulldogs.

The following are extracts from the official narrative:—

During Monday, July 27, ten raids crossed the east coast between Dover and Harwich and attacked targets at Hornchurch, North Weald and Biggin Hill. Seven high-altitude raids between 25,000 feet and 10,000 feet and three low-flying raids were carried out. All three low-flying raids were intercepted. In the high flying raids, the skilful use of cloud, and in some cases the loss of height on the way to the targets, made the task of the defence more difficult and as a result some of them reached their objectives without being attacked. Even so, a satisfactory proportion of interceptions was made by the fighters.

Varying Fortunes

During the evening phase weather conditions were favourable to the defence, there being less low cloud than during the day period. Ten raids, varying in numbers from three to ten aircraft, crossed the coast and attacked from varying heights up to 20,000 feet. A high proportion of these raids was intercepted.

The operations ceased at 9 p.m. until 1500 hours on Wednesday.

During the daylight hours of Wednesday seven formations of from three to ten day bomber aircraft carried out attacks on the aerodromes of North Weald, Biggin Hill and Hornchurch, the raiders approaching from the Thames Estuary and the Straits of Dover between Harwich and Brighton.

A layer of broken cloud at a height of 3,000-6,000 ft. assisted the attackers to avoid observation. Three low-flying raids were attempted and four medium-height raids, of these three of the medium-height raids were intercepted before they reached their objectives, but the low-flying raids reached their objectives without being attacked. Two of the low-flying raids were intercepted on the way out. The medium-height raiders were flying at a favourable height for machine-gun and anti-aircraft fire and would have been considerably harassed by the ground defences.

During the night period the Territorial searchlights were operating. Conditions were favourable for the searchlights and a number of targets were illuminated successfully. The attacking aircraft were able to operate at their maximum height, and made good use of small patches of medium cloud for evasion. The attacks were delivered by night bomber aircraft flying singly, the majority of the raids being carried out at heights between 10,000 and 15,000 feet; few raiders flew below 6,000 feet.

PERFORMING MICE : An amusing snapshot from behind a Zwicky refuelling unit at Biggin Hill, with Bulldogs of No. 32 Squadron which took part in the Exercises.

Approximately thirty-one single aircraft raids were carried out during the period 2130 hours to 0400 hours, July 30, of which the majority were intercepted and attacked by the fighters.

The final period was from 0400 hours to 2359 hours on Thursday, July 30. During daylight the weather conditions were favourable, with the exception of local fog and low cloud in the early morning. The first formation of ten aircraft to attack approached the coast at 5,000 feet and was intercepted by a fighter squadron over Streatham.

The next two raids, comprising formations of five and ten aircraft, were flying at the same height, but in the meantime, as anticipated, ground mist had covered the aerodrome and district near Hornchurch so that fighters located there were unable to leave the ground to intercept these raids. One of these raids was, however, attacked after it had passed over Hornchurch by a squadron from Biggin Hill. After that, fog and low cloud became fairly general and hampered the activities of both attackers and defenders until about 0930 hours, when conditions improved.

Thirteen formations of aircraft attacked targets near London. Of these raids, nine were high altitude raids up to 25,000 feet and four were low-flying raids. A very high proportion of these raids was intercepted before reaching their objectives.

The night operations commenced at 2030 hours; the weather during the period up to 2330 was favourable but, owing to the approach of low cloud and rain, operations were terminated at midnight.

Twenty night raids by single night bomber aircraft were carried out, and of these fifteen were intercepted by fighters.

The Territorial searchlights operated during the night period and although the conditions were not so favourable as the previous night, due to haze, they were able to illuminate most of the raids.

The co-operation of the anti-aircraft units and the Observer Corps in the exercise have proved extremely valuable. High praise is due to the members of the Observer Corps, who volunteer their services and who, in spite of the fact that the Corps is composed to a great extent of men who have been following their normal occupation during the day, were on duty during much of the night operations period. The anti-aircraft units contributed considerably to the success of the defending force.

A NEW R.A.F. VOLUNTEER RESERVE

THE following are the main features of the scheme announced by Viscount Swinton, Secretary of State for Air, in the House of Lords last week to provide adequate reserves of pilots for the expanded Royal Air Force:—

His Majesty the King has approved the creation of a new reserve, called the Royal Air Force Volunteer Reserve, which will be open only to men in civil life. The Reserve will embrace pilots and other classes; the organisation of the pilot's section is being proceeded with at once as it is most urgent.

The number of pilots required annually for the Volunteer Reserve will be 800, as compared with sixty from civil life before the expansion of the Royal Air Force began. They will receive their flying training at *aerodrome centres* which will be established in the vicinity of important towns and areas with a large population. There will be a network of such centres throughout the country, with several in the neighbourhood of London. Ground instruction will be provided at *town centres* at which lectures on the theory of flight, airmanship, and other essential subjects will be given. The lectures will be arranged mainly during winter evenings when opportunities for flying are necessarily restricted. The centres will also be available for social purposes.

The aerodrome centres will be organised on similar lines to the existing Civil Flying Schools, at which reserve flying training and the initial training of pilots for the regular Air Force is at present carried out. They will be operated by firms under contract with the Air Ministry. Action is being taken immediately for their establishment.

Volunteer pilots will be recruited from the neighbourhood of aerodrome centres, entry being confined to candidates between the age limits of 18 and 25. The minimum period of service will be five years.

Previous flying experience is unnecessary but candidates should have had an education up to the standard of the School Certificate. They will be entered as airman pilots with opportunities later for promotion, on merit, to commissioned rank.

The flying instruction will be arranged to allow pilots to train at week-ends, in the evenings, and at other times convenient to them. They will be encouraged to spend as much time as possible in the air in order to gain flying experience of value to the service. In addition, volunteers will have to attend an annual flying course of fifteen days' duration.

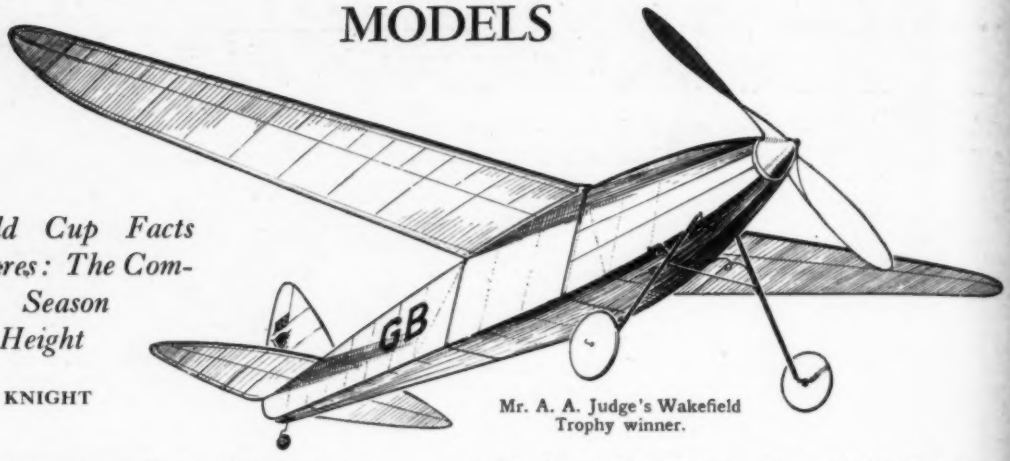
The Reserve pilots will receive a retaining fee of £25 a year and appropriate allowances while under training.

Arrangements are being made for the scheme to come into effective operation early in 1937, but in view of the administrative work still to be undertaken applications are *not* desired from candidates until after details have been announced regarding the location of aerodrome centres later during the present year.

The new Reserve will also provide facilities for men who can arrange to devote a continuous period of eight to ten weeks for their initial instruction during their first six months of Reserve service. For this particular section applications are invited *immediately* and should be made to the Secretary, Air Ministry, (S.7.c.), Kingsway, W.C.2. The same age limits will apply and the conditions of service will be generally similar to those announced above.

Present members of the Royal Air Force Reserve who entered from civil life will be afforded the opportunity of transferring to the new Reserve.

MODELS



Mr. A. A. Judge's Wakefield Trophy winner.

Wakefield Cup Facts and Figures: The Competition Season at its Height

By M. R. KNIGHT

How Britain Won the Wakefield Trophy

THE team of six modellists which went to America has, as already announced in *Flight*, brought back the Lord Wakefield International Trophy, the most coveted award in model aeronautics. The contest was flown on July 1 at Wayne County Airport, twenty-five miles from Detroit, and was witnessed by over 2,500 spectators. Teams of British, American, French, New Zealand and Australian models competed. The weather, though good, was lacking in thermals, and prolonged flights were the exception rather than the rule.

Models had to rise from the concrete runway, and the average of three flights was taken. The winner proved to be Mr. A. A. Judge, of The Model Aircraft Club, with flights of 8 min. 17 sec., 2 min. 56 sec., and 1 min. 50 sec.

The second man was Mr. Roy Wriston, of Oklahama, with an average of 4 min. 2 sec., only 7 sec. behind the winner! Third and fifth places went to British competitors, Messrs A. Copland (Northern Heights M.F.C.), and J. B. Allman (Midland M.F.C.). Mr. Allman won the trophy in 1934, but this year the friction set up by a fractured bearing reduced his climb and consequently his duration of flight. Last year's winner, Mr. Gordon S. Light, of Pennsylvania, was sixth.

The Trophy was given to the Society of Model Aeronautical Engineers by Lord Wakefield in 1927, and Britain has now won it for the fifth time. The team was taken to America by Mr. B. K. Johnson, Mr. J. C. Smith and Mr. H. York, vice-chairman, competition secretary and press secretary respectively of the S.M.A.E. Mr. Judge was presented with the Trophy and a small replica by Dr. A. P. Thurston, chairman of the S.M.A.E., at a banquet on the evening of the team's return from America.

The Winning Model

THE model illustrated this month is, very fittingly, the fine super-duration lightweight with which Mr. A. A. Judge won the Wakefield Trophy. It is characterised by sound design, pleasing lines and excellent workmanship. Built throughout of medium balsa, it weighs 4½ oz.

The wing is in two parts and is attached in the customary manner by two rubber bands anchored to four small pegs in the centre section and passed around the fuselage. The span is 44½in., the chord tapers from 5½in. at the centre to 3½ at the end rib, from which point the leading-and trailing-edge spars curve sharply to a blunt point. The section is a modified Clark Y, the depth being increased somewhat. The main spar is 1/16in. in thickness and occupies the full depth of the wing. The leading edge is of ¼in. × ¼in rounded off, and 1/16in. × 1/16in. is used for the trailing-edge. There are 22 full ribs and 16 riblets reaching from the leading-edge to the main spar, all 1/16in. in thickness.

Four longerons of ⅛in. × ⅛in. balsa are used for the 30in. fuselage, which is rectangular in section from the sternpost to the wing location, the fore part being rounded by means of five stringers. The nose-piece is a circle 1¾in. in diameter. The undercarriage consists of bamboo main struts, with springs and axle of 20 S.W.G. steel wire and 2in. balsa wheels.

The tail-plane, which is somewhat "De Havilland" in plan form, has a lifting section, but is set at neutral incidence. The span is 17in. and the maximum width 5¼in. Constructionally it resembles the wing. The vertical fin has its base shaped to fit tightly over the tail-plane, both being separately removable from the fuselage.

A single six-strand skein of ¼in. × 1/20in. Pirelli rubber turns the 16in. diameter airscrew, which is fitted with a free-wheeling device, and is so mounted as to secure about 3 deg. of down-thrust. The spinner contains a rubber-tensioner.

Other Events

THE six models entered by Great Britain in the contest for the Admiral Moffett Trophy which was held at Detroit, U.S.A., on July 2, were flown by members of the British Wakefield team. Third and fifth places were won respectively by Mr A. Worley (Northern Heights M.F.C.), with a total of 9 min. 45 sec. on three rise-off-ground flights, and Mr. W. Worden (T.M.A.C.), with a total of 7 min. 40 sec.

The Trophy was won by Mr V. B. Gray, of New Zealand.

* * *

This year the S.M.A.E. gliding contest was held on the grounds of the affiliated clubs, the models having to be catapulted. Mr. T. H. Ives (Hayes and D. M.A.C.) again won the contest by averaging 60 sec. on three glides. Mr W. H. Hughes (Windsor M.A.C., Manchester) averaged 43.07, and Mr. R. F. Hook (Blackheath M.F.C.) 30.93

* * *

The S.M.A.E. Seaplane Contest, held at Danson Park, Welling, on June 28, again demonstrated the effectiveness of two main floats and a small tail float, all of the flat-bottomed "pontoon" type. Seventeen models took part. Victory went to Mr. H. W. Bexley (Luton and D. M.A.C.), who averaged 63.5 sec. on three rise-off-water flights. Mr. T. H. Ives (Hayes D. M.A.C.) averaged 49.4, and Mr. R. F. Hook (Blackheath M.F.C.) 47.75. All three flew high-wing monoplanes.

* * *

The organisers of the Second Grand Rally of the 10th Group, T.M.A.C., Messrs. Orchard and Henery, must have felt encouraged by the large numbers at Wimbledon on July 5. The meeting was outstanding for variety of models, these including biplanes, a Pterodactyl, three autogiros, including Mr. D. A. Paveley's twin-pusher "spar" with four-bladed rotor, and a fuselage "Ente" or "tail-first," also by Mr. Paveley, which flew for 66 sec. Mr. H. E. White, B.Sc., of the Northern Heights Club, achieved flights of 93 sec. hand launched and 79 sec. R.O.G. with his 10 oz. ungeared biplane *Gemini*. These figures are being submitted to the S.M.A.E. for record purposes. Each wing is 45in. in span and has 52 ribs!

* * *

The Northern Heights Model Flying Club was responsible for an exceptionally interesting exhibition of model aircraft on the occasion of the De Havilland Annual Sports at Hatfield on July 18. The exhibition was substituted for a flying display which the gale rendered impossible.

Latest news is that the small band of models enthusiasts at D.H.'s have formed themselves into the De Havilland Model Aero Society, with a ground at Kingsbury.

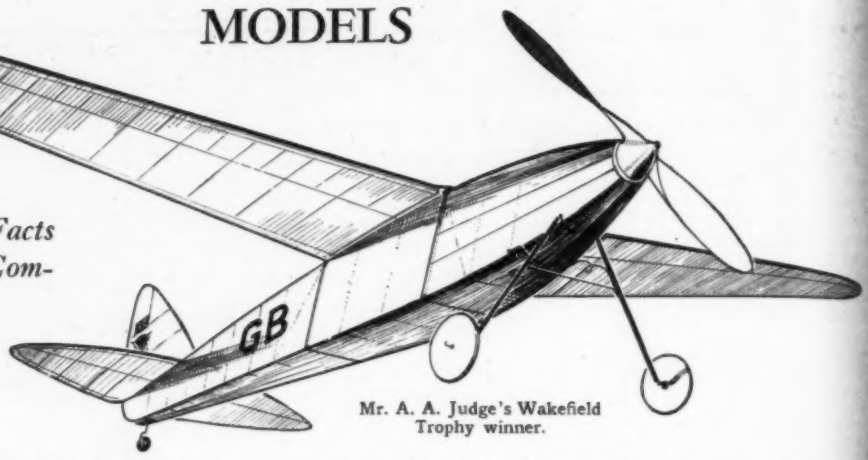
* * *

On August 15 the Liverpool M.A.S. is flying its Chairman's Cup Competition "for machines reasonably capable of full-size construction as opposed to duration, freak or scale models."

MODELS

Wakefield Cup Facts and Figures: The Competition Season at its Height

By M. R. KNIGHT



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The Trophy was given to the Society of Model Aeronautical Engineers by Lord Wakefield in 1927, and Britain has now won it for the fifth time. The team was taken to America by Mr. B. K. Johnson, Mr. J. C. Smith and Mr. H. York, vice-chairman, competition secretary and press secretary respectively of the S.M.A.E. Mr. Judge was presented with the Trophy and a small replica by Dr. A. P. Thurston, chairman of the S.M.A.E., at a banquet on the evening of the team's return from America.

The Winning Model

THE model illustrated this month is, very fittingly, the fine super-duration lightweight with which Mr. A. A. Judge won the Wakefield Trophy. It is characterised by sound design, pleasing lines and excellent workmanship. Built throughout of medium balsa, it weighs 4½ oz.

The wing is in two parts and is attached in the customary manner by two rubber bands anchored to four small pegs in the centre section and passed around the fuselage. The span is 44⅛in., the chord tapers from 5½in. at the centre to 3¼ at the end rib, from which point the leading-and trailing-edge spars curve sharply to a blunt point. The section is a modified Clark Y, the depth being increased somewhat. The main spar is 1/8in. in thickness and occupies the full depth of the wing. The leading edge is of ¼in. × ¼in rounded off, and ⅝in. × 1/8in. is used for the trailing-edge. There are 22 full ribs and 16 riblets reaching from the leading-edge to the main spar, all 1/8in. in thickness.

Four longerons of ¼in. × ¼in. balsa are used for the 30in. fuselage, which is rectangular in section from the sternpost to the wing location, the fore part being rounded by means of five stringers. The nose-piece is a circle 1¾in. in diameter. The undercarriage consists of bamboo main struts, with springs and axle of 20 S.W.G. steel wire and 2in. balsa wheels.

The tail-plane, which is somewhat "De Havilland" in plan form, has a lifting section, but is set at neutral incidence. The span is 17in. and the maximum width 5¼in. Constructionally it resembles the wing. The vertical fin has its base shaped to fit tightly over the tail-plane, both being separately removable from the fuselage.

A single six-strand skein of ¼in. × 1/20in. Pirelli rubber turns the 16in. diameter airscrew, which is fitted with a free-wheeling device, and is so mounted as to secure about 3 deg. of down-thrust. The spinner contains a rubber-tensioner.

Other Events

THE six models entered by Great Britain in the contest for the Admiral Moffett Trophy which was held at Detroit, U.S.A.,on July 2, were flown by members of the British Wakefield team. Third and fifth places were won respectively by Mr A. Worley (Northern Heights M.F.C.), with a total of 9 min. 45 sec. on three rise-off-ground flights, and Mr. W. Worden (T.M.A.C.), with a total of 7 min. 40 sec.

The Trophy was won by Mr V. B. Gray, of New Zealand.

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This year the S.M.A.E. gliding contest was held on the grounds of the affiliated clubs, the models having to be catapulted. Mr. T. H. Ives (Hayes and D. M.A.C.) again won the contest by averaging 60 sec. on three glides. Mr W. H. Hughes (Windsor M.A.C., Manchester) averaged 43.07, and Mr. R. F. Hook (Blackheath M.F.C.) 30.93

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The S.M.A.E. Seaplane Contest, held at Danson Park, Welling, on June 28, again demonstrated the effectiveness of two main floats and a small tail float, all of the flat-bottomed 'pontoon" type. Seventeen models took part. Victory went to Mr. H. W. Bexley (Luton and D. M.A.C.), who averaged 63.5 sec. on three rise-off-water flights. Mr. T. H. Ives (Hayes D. M.A.C.) averaged 49.4, and Mr. R. F. Hook (Blackheath M.F.C.) 47.75. All three flew high-wing monoplanes.

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The organisers of the Second Grand Rally of the 10th Group, T.M.A.C., Messrs. Orchard and Henery, must have felt encouraged by the large numbers at Wimbledon on July 5. The meeting was outstanding for variety of models, these including biplanes, a Pterodactyl, three autogiros, including Mr. D. A. Paveley's twin-pusher "spar" with four-bladed rotor, and a fuselage "Ente" or "tail-first," also by Mr. Paveley, which flew for 66 sec. Mr. H. E. White, B.Sc., of the Northern Heights Club, achieved flights of 93 sec. hand launched and 79 sec. R.O.G. with his 10 oz. ungeared biplane *Gemini*. These figures are being submitted to the S.M.A.E. for record purposes. Each wing is 45in. in span and has 52 ribs!

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The Northern Heights Model Flying Club was responsible for an exceptionally interesting exhibition of model aircraft on the occasion of the De Havilland Annual Sports at Hatfield on July 18. The exhibition was substituted for a flying display which the gale rendered impossible.

Latest news is that the small band of models enthusiasts at D.H.'s have formed themselves into the De Havilland Model Aero Society, with a ground at Kingsbury.

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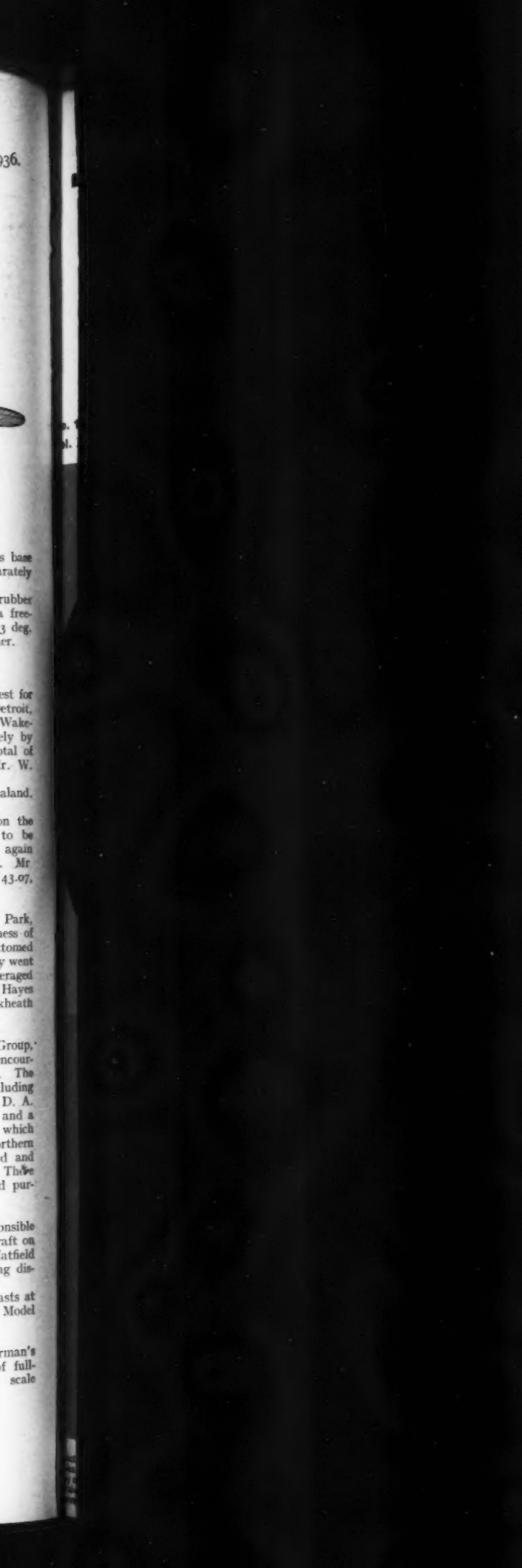
On August 15 the Liverpool M.A.S. is flying its Chairman's Cup Competition "for machines reasonably capable of full-size construction as opposed to duration, freak or scale models."